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THE CHILD GOD

By Lorey C. Day, Baldwinville, Mass.

You may know of Mars and Venus and many other worlds, but I doubt if you ever heard of Exlose. It came out of darkness, shone forth gloriously a few years, and then disappeared. Exlose was an imaginary world and I was its god. Every child is at one time a god. He is the supreme ruler of an imaginary universe. He creates and dominates a world of make-believe geography, make-believe people, and make-believe institutions. He is the First Cause of everything. No river flows, no person speaks, no institution acts, without his willing sanction. Yet he is not a proud god, for he lives among his people and they are all friendly and intensely real to him.

The history of Exlose is not unlike that of Earth. There was an age of Chaos, of War, of Industrialism, and of Decline. Mine was no paradise of kind fairies and special favors. Everything was cold and material, and followed worldly law. From chaos arose no supernatural creation of order, for a systematic unity was a slow evolutionary development. There were no miracles of battle, and victory and fame were attainable only through hard work. Industrialism's progress was gradual and continually beset by war; while even decline followed the natural trend, there being no quick doomsday extinction, but merely a steady scientific disintegration. Down to its finest detail my Exlose reflects its earthly origin—I lived in a materialistic household, read realistic literature, and followed the newspapers closely. Exlose presents the real

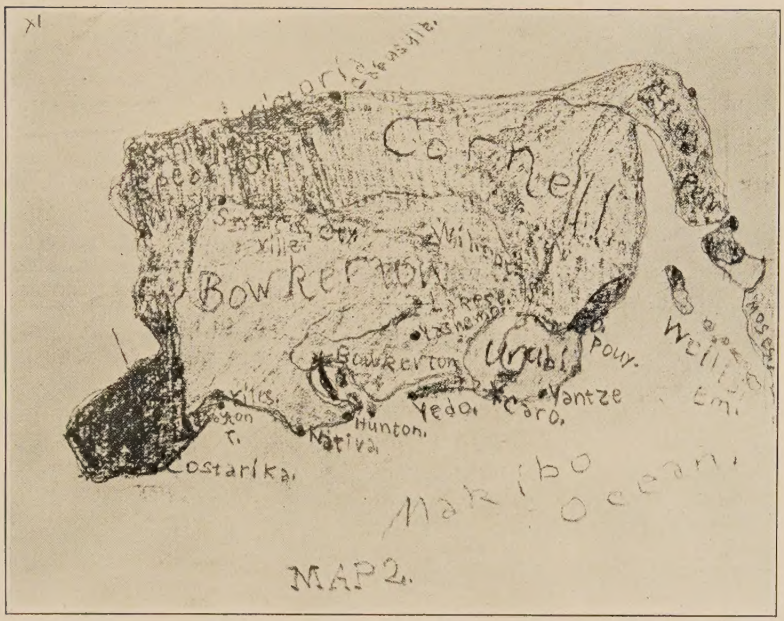
world as it seems to the small boy. It is a kind of imaginative revision of real society.

I was a god with a strong bent for printing and drawing—an editorial god, as it were—and many of my greater activities are preserved as news and sketch in a small hand-printed newspaper. I entered upon the chaotic era at six, while the Spanish-American War was in progress. Maps show the world to be one-sided, flat, and egg-shaped, with my home village at its center, a few nearby towns clustered about, and with "Cabu" (Cuba) set apart in one corner. The land was shattered by peninsulars and gulfs into octopus form, and was entirely surrounded by an ocean of swirling lines. This map often changed. Sometimes a thin rim of "U. S. A." encircled the nearby towns, and both land and sea were constantly shifting about. Generally skyless and weatherless the world would from time to time be set adrift in space among clouds, moon and sun after the careless manner of school geographies.

After Chaos came War. Every boy is more or less a warrior, but the military idea was particularly strong in my group, because of the Spanish, Boer and Boxer conflicts. There were few robbers and pirates among us, for all our energies were absorbed in battle. Slowly the Exlose world developed two distinct aspects, real and imaginary. The real was physical, the imaginary of course mental. The real consisted of wild charges across the fields, the imaginary of scribbled maps and feverish news items. The real was known to all the neighborhood, but the imaginary was a secret between myself and my paper's one subscriber—a gray-haired aunt. A few of my warring comrades, however, discovered our secret, for I was always naming the hills and trees, and allotting fictitious titles.

First campaigns were rather spasmodic, but organization developed rapidly. Each boy was equipped with a wooden gun and, sometimes, with sword, pistol, belt, and camera-box, for lunch. The up-hill bayonet charge was the most popular form of activity, and eating was in high favor when resting in camp. Boys were usually all on one side, with every one an officer, and combating a common make-believe enemy. Two real sides were exceedingly dangerous. There was only one serious two-sided engagement, and that resulted in many bruised faces and the practical demolition of an abandoned horse-car, which played the rôle of ill-fated fortress.

Small realities were the stimuli which set going a large imagination. A good-natured afternoon skirmish became in my paper a battle of this kind:



CONTINENT No. 1

(Maps taken from 1st and 2nd editions of "An Atlas of the Exlose World.")

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BATTLE OF ZOX.

Sept. 29.—Gen. Day with 35,000 men captured Zox and 4,000 men. Losses are A. S. 23 killed Kingsure 24 killed A. S. woned 17 Kingsure 18 wounded.

The battle of Zox was the most interesting battle ever known.

In the Battle 45 shells used.

In the Battle was 25,000 bullets.

The first prisoners were taken in the battle of Zox.

It was the first (time) Day's wonderful canoon was used in the battle of Zox.

A more decisive victory was at Grange in the war with the F-L's:

BATTLE OF GRANGE.

Grange, City., Dec. 7,—Specail telagram at 5:30.—The soldiers of our country have done good work and have beaten the F-L's and killed 500 and wounded 178 and 25,000 have surrendered. For a while the air was so full of shells that you could hardly see. The F-Ls only killed 120 of our men and wounded 25. None surrendered.

Signed, Gen. Day and Gen. Den Witts.

Gen. Day had 29,000 men and Gen. Den Witts had 15,000 men.

Ceaseless warfare naturally gave rise to many diplomatic bickerings. My paper frequently published "secret" letters to Gen. Day, coming from the enemy's camp or from some friendly allied ruler. King Lap-tet of Un Se Bal sought to aid me by imparting this valuable geographical information:

Dear Friend; Sept. 17, 1900.

The name of that Blue contry is Fattleland population 100,000,000. Kingsure Islands are called Hailers Inland population 5,000,000. That pink contry is Linkland population 7,000,000. Them 3 yellow contry are called Liten population 4,000.

Yours truly,

King Lap-tet.

Less studied, but more important, diplomacy was necessary to keep the real side of my world in harmony. There were three of us who had become actively interested in Exlose and, to keep peace, each became a president, and whenever we entered battle it was as allied generals with equal powers. We formed a sort of Triple Alliance whose aim was to keep the whole imaginary world in subjection.

My active militarism was soon to fall prey to imaginative red tape and detail. Under the influence of the United States census of 1900 I became seriously addicted to the use of statistics. Everything on Exlose—area, population, armies, navies—was reduced to tabular form. Half the interest in a battle was the difference it would make in population, and victory was heralded with joy chiefly because it added a few square miles of territory—not that the territory might be valuable, but because it was a few square miles. A new bat-

tleship was important not because of the added naval power, but because it had so many smokestacks, portholes and officers. And the most essential thing about a new ally was its flag and uniforms. So long as the flag was multi-colored and the uniforms gay victory did not matter, or would come of itself.

With such attention to detail the means necessarily came to obscure the end. Finding an unlimited field for action in statistics, imagination waxed strong and, finally, the physical side of Exlose was overwhelmed completely. There were no more garden skirmishes and up-hill charges; every battle now took place on paper, and the face of the world was changed at will in the comfortable quiet of my study.

The rough maps showing my village as the center of the world represent the chaotic era. During the military period these maps underwent a complete revolution. The real towns, U. S. A., and even Cabu disappeared entirely, giving way to new, make-believe countries. Earth was cast aside and Exlose entered upon an independent existence. Exlose at first was a mass of islands, with each island a country or province. It is in this island stage that the first great wars take place. But, gradually, under the influence of real-world geography, small continents appear, and on the east coast of one rises the confederacy of "American States," better known as simple "A. S." The capital city is "Printston," and its ruler is the militant President Day.

Around A. S. in nearly every direction were hostile countries, and the President was forced to conquer or be conquered. He directed campaigns in three directions, north, south and inland. To the north he was engaged in a series of bloody wars with Kinsuer, inland with Moses and Fatinland, and to the south with Grenoe and a half-independent union of three large states, Un Se Bal, Mispolie and Lisyvinsue. The northern Kinseur territory was won after a series of land and naval victories, all equally terrible. At last the unfortunate country was thoroughly humbled and, flushed with success, I led my army across the sea to the very gates of the venerable capital city of Czarinae. Moses went down in easy defeat, and was forced to give up half its lands. Fatinland was less easy, my armies being repulsed upon several occasions, but there finally came a sweet revenge when I advanced by river to the gates of the royal palace at Fatima, where I forced the cession of vast territories and the royal city itself.

In the south I encountered more resistance. The south, in real life, was the back yard, and opportunities for fighting

CONTINENT NO. 2

there were unlimited, and unhampered by peace-loving neighbors. So it was that Grenoe was last to submit. I met defeat after defeat and sometimes as many men were "killed" on my side as on the enemy's. When I gained victory, however, it was decisive, and offset all previous defeats. One after the other Un Se Bal, Mispolie, and Lisyvinsue fell or, in terror, became my ally; I captured the Shantung peninsular and the fine city of Santefredo. Then the enemy entrenched itself about Wicwar for a last stand. Wicwar was a magnificent city at the mouth of the Prescott River, which flowed through the very heart of A. S., and of course was a highly desirable prize. Situated on a delta the city was hard to approach, but at length my ships and army made a full circle, there was a long siege, and Wicwar fell. Grenoe itself, shorn of all its dependencies, was next attacked—as usual—near its capital, but peace was quickly secured through the cession of Wonderland, a rich peninsular abounding in ores, minerals, and forest products. Later there were short wars for distant colonial strongholds, but the siege of Wicwar marks the practical end of the military era. A. S. had added twenty times to its original area, several million people, and untold wealth.

With no more desirable nations to conquer, the warring president sat back in his editorial chair to plan out an industrial régime. The map was in sad disorder after so much turmoil, and the first step was to establish Exlose on a systematic basis. Continents were reduced to four, with several scattered islands. Then each continent underwent a slow revision. Rivers began to flow in fixed courses, and bays, capes, and all natural features were given a permanent position and a name. Countries were marked off, some with states, and each with a capital city and several lesser towns. My home continent—Continent Number Two—was naturally the most highly developed of the four. A. S., as a name, was superseded by the more egoistic "Dayton," state lines carefully drawn, and cities located at convenient distances. Most of the first cities were sites of famous battles, but as industrialism grew, new cities grew to meet its demands. A play railroad—in reality a hundred yards along the street—was transferred to the map. This railroad, with its branches, demanded the creation of several new towns—and so Beville, Hailston and Chesterfield grew up about Printston. Other routes were imagined and put onto the map, and Kingsbury, Lanesville and York appear. New industries, mineral and oil discoveries, forest areas, farm lands, all came in season, and then arise the "boom" towns of Yava, Farmington, Gold City and Maculay. There were about a dozen states, and

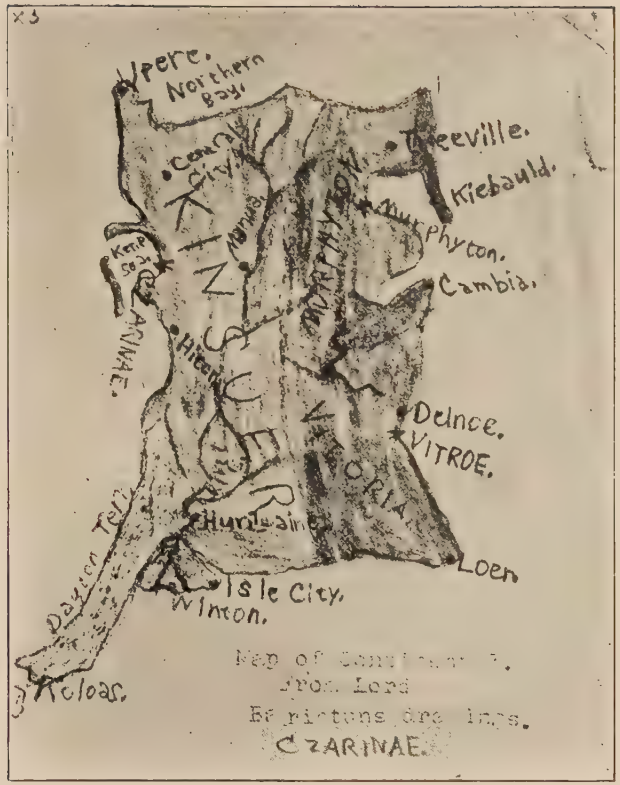
each was blest with a name—Clifton, Mendoceno, Odell, Cornwall and Mantobia were the leaders. And even the railroads did not escape the naming genius—observe the B. & H., Daisy, Clover Leaf, Merchants, Fruit, and the K. & Q.

Every name is reflective of some one or more influences, and all together are significant of the breadth of my experience as a small boy. Beville, Lanesville and Yava can be traced to home experiences, Mendoceno and Cornwall to geography, and Odell and Maculay to my literary acquaintance with great men. My total name creations number over a hundred, and each one is traceable to its source. Some are plagiarisms pure and simple, some are corruptions (conscious or unconscious), and some are inventions built out of old names or from syllables jumbled in play.

Many of the cities were very real to me. Wicwar, vaguely associated with New Orleans, I fancied as a great delta city with wharves and ships, immense warehouses and business blocks. My imagination had surrounded Wicwar with a deal of fine sentiment and, as president and railroad magnate, I often visited there. A peculiar combination of associations explains my favoritism. In real life the city was a certain spot in the garden, its war-scarred history gave to its past a decided glamor, and even the name itself was bound up in pleasant experiences—Wicwar being a conscious variation of Warwick, the name of a small hamlet where I had been several times with my mother.

Printston, my home city, was teeming with life and action. There was a great harbor guarded by impregnable forts at its entrance, and through the city ran the historic Grange River, furnishing generous water power to the factories along its way. Many of the streets were named, and four or five skyscrapers and public buildings were well developed as regards detail of size and arrangement. My newspaper was housed in a splendid five-story structure of brick and granite, situated at the corner of Wabash Avenue and Cross Street, and backing on the river, which furnished power for the presses and other machines. Besides an editorial staff, there was a group of half-imagined employees. I treated all with great kindness, but my best friend was the night watchman, with whom I often chatted familiarly night and morning, while in bed.

The railroads at Printston were of especial attraction, and I frequently rode on the trains out into the country, taking charge of the throttle to relieve some tired engineer. The goal of my journey would be one of the older sentiment-laden towns of the Wicwar type, such as Beville and Hailston, the first two industrial centers, Grange, site of the great battle,



Continent No. 3.

and Chesterfield, a terminal of the first railroad. Saturday nights I planned an unusually delightful trip. My paper was then distributed from a special train to which was attached a private editorial car. Sometimes this private car was my bed, and the wild imaginative joys peculiar to the Saturday night ride no doubt arose from the very real anticipation of a long Sunday morning sleep.

I saw to it that Dayton was ever supreme in population and wealth, but I was generous in extending organization and names to the rest of the continent. The shattered remnants of Moses and Fatin-land were both put on industrial bases; new cities arose to meet the new industrialism. Pilsen, a third country, in the northwest, was similarly developed, and its commerce was facilitated still further by the construction of two long canals.

Continent Number One, associated somewhat with Asia, and the largest of the Exlose land areas, lay to the westward of Dayton and Continent Two. Its chief occupant was Bowkerton, under the rule of a real boy, Bowker, who had generously contributed the whole continent, both in reality—a field—and in imagination—a map. Bowkerton, too, was rapidly spread over with railroads and towns. The capitol, Hanover, was a coastal city with a million inhabitants and comparing favorably with Printston. Rimming the northern and western borders of the country were several minor states and kingdoms. Spearton was a small, half-real republic with a flesh-and-blood president; Victor-Vitoria was a dual monarchy having only an imaginary existence, and peopled by a north European-like race. Cornel, associated with Russia, was the humble remnant of a mighty country which had formerly occupied most of the continent. Cristina, Hibernia and Orubia were three small republics that had revolted from Cornel.

Extending away from the southeast coast of Continent One, and partly parallel to the west coast of Continent Two, were the Wellise Islands. The northernmost of these was Icedoc, seized by Dayton in an early war with Cornel. The other islands, six in number, comprised the Wellise Empire.

The greatest of the make-believe powers was my sometime enemy, Kinsuer, represented in truth as a field directly opposite my home. Kinsuer occupied Continent Number Three jointly with another half-real republic, Murphyton, which was under President Murphy of the diplomatic Triple Alliance. A small central area—Chinaton—was under the protection of both governments, and a southern peninsular was under Dayton rule. The population of Kinsuer in its last census was 41,116,635, its capital was the ancient Czarinae—once threat-

ened by General Day, and its last ruler was the benevolent King George. Kinsuerian culture was in a vague way like that of western Europe, and the entire Third Continent lay in an easterly direction from Dayton, with Czarinae and Printston bearing a relation to one another comparable to that of London and New York. The northern coastline was broken and rocky, and associated with Scotland, while the south was semi-tropical, often swept by wind-storms, and in its geography reminiscent of Greece and Italy.

Southwest of Kinseur and directly south of Dayton was Grenoe. Its people were wild and Chinese-like, while its general map outline and position resembled closely Australia and, like Australia, it was sometimes considered as an island, sometimes as a continent—Continent Number Four. In later times, after Dayton had succeeded in conquering and annexing its more desirable northern territories and islands, Grenoe settled down as a peaceful, progressive nation, and its last monarch, Emperor Wilum IV, was a great educator and very friendly with President Day. It was a universal law that, after the loss of the best land and thriftiest people to Dayton, a country became happy and prosperous, and was everlastingly grateful to its greedy benefactor.

Harte Island, a part of Grenoe, and half the size of the mother country, was the afterthought of a guilty conscience. When Grenoe was at the low ebb of its fortunes, I hastily created this island in the midst of the Makibo Ocean, hoping that perhaps this new territory would at least partly make up for the old I had taken by conquest. Yet there was still a germ of selfishness in this charity, for a portion of the new island was later utilized as a Dayton colonial station.

A second afterthought was Sargwine. A great vacant place in the southern sea demanded another island to balance up the world's land surface, and Sargwine was the fulfilment of this demand. In shape it resembled Cuba, but in position and natural endowment it was more like the Philippines. For a short time upon " discovery " the sole occupants were a few faint-hearted wild blacks, who were easily overcome and subjected to the salutary colonial rule of Dayton. Aggressive Daytonians found rich gold mines and many rare stones, and a providential supply of coal was just sufficient for passing trade ships.

The Adle and Adalia Islands were two A-shaped groups in mid-ocean between Continents One and Two. Both were semi-tropical and populated by a half-civilized brown race. Adalia was fairly high on the scale of progress, and its ruler, the Duke, was a friend and fellow of all the kings and presi-

Continent No. 4

dents in Exlose. During early days there was much fighting in both Adle and Adalia but peace soon came to reign under a strong Duke and, for some unaccountable reason, Dayton never molested him save quietly to negotiate for an open port on a northern island.

This world with such a perfect organization possessed one very serious geographical flaw. It had no equator. Exlose was round, it had a north and south pole, continents, oceans, rivers, everything essential to the welfare of a good world, except an equator. There was a central line of course, but it was not considered an equator, and bore no relation whatever to the sun. The sun followed only the south pole. There were no complications of sunshine and climate on Exlose. There was a plain north and south, with the north cold and the south hot, no matter which hemisphere you chose. The north pole was like Earth's, but the south pole was tropical the year round. Exlose was the product of the northern hemisphere and to the last remained true to its producer. There were no southern heresies such as snow in July and harvest in January.

Of the four hundred million people on Exlose only a small group became more than a mere "public." Personality was a privilege reserved for the very select few. I was much in the society of kings and warriors but I did not regard them as particularly real. General Hay was the only national hero that I endowed with personality and character. He directed many of my campaigns and we were often in conference. He was an elderly man with wide experience and superior wisdom; he was courageous, unconquerable and never known to lose a battle.

An era of war is no time for friendships, but with peace and the rise of industrialism I created a number of imaginary men and women. Most of these later characters were journalists and artists, and they represent the final triumph of the calm editor over the warring president-general. James Howe, the first of the later creations, marks the transitional stage—he began life as plain James Ow, an officer in the Kinsuer wars, but with peace he changed his name and joined my editorial staff. He served as a kind of business manager-reporter, though his duties were rather ill-defined. To Mr. Howe can be credited such frank exaggerations as this:

The U. S. JOURNAL M. B. Carcaltion (circulation) in August was 126,257. in July 114;322 June 103,501 May 94,0000 April 87,220.

He is also responsible for purchases of this nature:

2 New Presses 3 boiders (boilers) 892,000 tipe 178 balls of paper. TOTAL Press $200 Paper $85 Tpe $10 Boiders $250 (Total) $545.

Mr. Howe had a son, Jimmy, who was quite as important as his father. When Mr. Ow enlisted in the army, Jimmy was left behind alone and, out of pure kindness of heart, I took the boy into my office, giving him board in return for whatever he might write for the paper. He chose to write weekly letters, in simple straightforward narrative, treating upon the commonplaces of a small boy's life. After a time Jimmy tried to become a humorist through the easy and often ineffective method of bad spelling, and in his later communications it is obvious that he had read Shute's "Real Diary of a Real Boy."

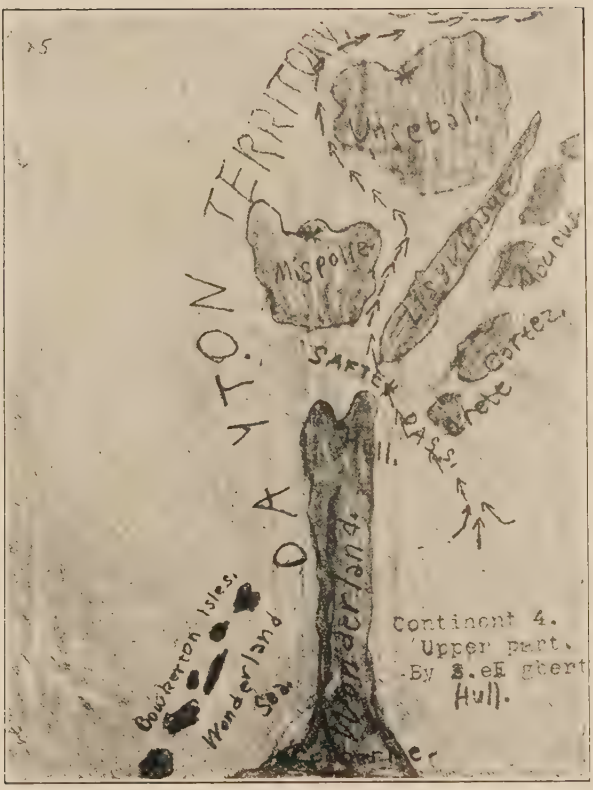
Two notable artists contributed pictures for the paper: Mr. J. J. Jackson furnished maps and sketches, while Mr. William R. Ross drew the comics and more finished illustrations. Jackson was early discharged or forgotten, but Ross continued his work for several years; he was intrusted to make new typographical arrangements, to invent new type faces, and to decide upon color schemes. In fine, he was a personification of the artistic side of my nature.

Various make-believe people, men, women and children, sent brief letters to the editor. Many of them told how well they enjoyed a certain new department or feature. One juvenile department, "J. L. O.," presents this letter-writing habit at its worst, for each week the whole J. L. O. page was devoted to letters telling how the writers delighted in the department the previous week. I tried to imitate the "experience" letters of the Sunday newspaper juvenile pages, but I succeeded in producing only testimonials of artless self-praise. Other correspondents dealt with weighty social problems, as did Miss T. O. Jinks, who takes the palm for keen social insight:

> Why Mary I think I will have to marrie about June 2, 1865. Yes I agreed. We wont qurriel like other people do. after they marrie their saying stop reading the news Oh do stop But we won't do that will we John. Oh, Corse not I won't do that. But they did when they married.

The Miss Jinks of real life was my aunt, who had been happily married nearly fifty years, but who was still skeptical about matrimony.

As publisher I had to buy imaginary printing supplies (through Mr. Howe, of course), and for this need several imaginary business houses were established. These houses were only half personal. I transacted business with the make-believe owner or manager, but my chief interest was in the purchase and payment. I patronized most the King Engraving Company, situated across the river from my office build-



CONTINENT No. 4

(Upper part, showing islands between Conts. 2 and 4)

ing in Printston; the Arlington Paper Company and the Oldberg Ink Company were two other friendly concerns. Oldberg was a city name and entirely impersonal in its associations, but Mr. Arlington of the paper company was at one time active in Dayton politics as a senator, and I often called him in to act as presidential advisor in perilous crises. There were other people but none were so vividly realized as these. I occasionally made out a cabinet list, consulted a governor or mayor, or praised an explorer, but few had names and none had well-developed personalities.

There were times when a wife moved dimly by my side. She had no particular name, and it would be absolutely impossible to describe her. In a vague way she was kind, good-natured and quiet, and possessed the happy faculty of disappearing when not wanted. She may have been a shadowy reflection of my mother. When I acted as president she was always near me during state functions, and as railroad magnate she often used to ride with me on a special car, but in war and on all boisterous occasions I forgot her entirely. And it is the beauty of imaginary people that when they are forgotten they do not exist.

My weekly paper tolerated imaginary news for four years. Three years it was scattered at random with the real news, but on the fourth it was carefully segregated in a column by itself, under the title of " M. B. (make-believe) News." Then it disappeared entirely. Exlose, however, was endowed with great vitality, and continued to exist even though newspaperdom was closed to it. The paper dropped it on the transitional stage between war and industrialism, at a time when industrialism was sorely beset by fire. The excitement of war lacking, new factories were burned daily, and railway trains were continually leaving the track or breaking through bridges. The fire at 211 Wabash Avenue is representative:

FIRE!

Feb. 16.—There was a great fire to-day at 211 Wabash Ave. in J. C. Tombs & Co., new shop stared last week in Tub buissness for printers to wash type in. The fire broke out at 4.15, and was put at 5.40. Cause is not known.

But as quiet settled down upon the land type, ink, paper, toy and furniture factories began to prosper without fire, and trains kept steadily to their tracks. With this peaceful uninteresting stage Exlose ceased to furnish news material. At last I realized that perhaps my aunt could not appreciate the subtleties of my fanciful imagination. There is little record of later industrial developments. A factory arose, flourished awhile in imagination, and left no trace except in memory.

Later geographical and political evolution, however, is well preserved in a series of small atlases—published by The Dayton Times Company at Printston, edited by ex-Senator J. M. Eldbridge, with statistics compiled by Mr. C. F. Fredericks, and maps designed by Mr. William R. Ross. The third and last edition of the Exlose Atlas appeared when I was fourteen. At that time I was passing from the fanciful imaginings of childhood to the more worldly day-dreaming of adolescence.

This strange World was at its hight shortly after the rejection of "M. B. News" from the papers, when I was eleven. At no time did I have so little regard for reality and so great a regard for the make-believe, as then. Half my life was lived in the imaginary city of Printston, and I was a more patriotic citizen of Dayton than I was of the United States. But as I approached adolescence I sought about more and more for realities. I became interested in things mechanical, and such real trivalities as windmills and bicycles set at nought the fine dreams of republics and empires. Such charming and ideal personalities as Mr. James Howe, or Jimmy, or Miss T. O. Jinks, and even my shadow Wife were all dropped for more earthly acquaintances within my social circle.

My last dalliance with the make-believe was shortly after the publication of the third atlas. Flushed with the new interest in baseball and baseball leagues I forgot the real world for a moment, and compiled a list of eight Daytonian cities, adjusting to them a daily imaginary league standing. Despite the worldly taint of this aftermath, old Exlose associations were strong, and the sentimental cities of Printston and Wicwar were given the highest standing and best players.

Exlose was a strange medley of history, geography and current events, all presented with a materialistic undertone. Why so few rewards and no fairies? I read few fairy stories. Why no kind providence and angels? I had little religious training. Why so much war and politics? I read the daily newspaper. Why so much industrialism? Mine was a manufacturing town. Nature gives the boy an imagination, but she leaves Society to supply its furniture.

ALPHABET FRIENDSHIPS

By Lorey C. Day, Baldwinville, Mass.

Alphabet friendships are not unlike human friendships. A certain fortunate man becomes associated in the mind with many pleasant experiences; man and pleasure are confused, one suggests the other, and both make for the fine sentiment of friendship. And letters of the alphabet, becoming associated through words with pleasing ideas and events, gradually evolve a pleasurable quality of their own. Everybody does not have alphabet friendships, but many have them without realizing it. To some people all letters look alike, others admit slight preferences, but more often it is a case of disclaiming any preference whatever, yet at the time showing it strongly in a marked favoritism for specific words.

Human friendship is sublime. In contrast alphabet friendship seems trivial and fanciful, and taken by itself perhaps it is. But they are governed by similar laws. Pleasant associations largely determine both and, after being once firmly established, both exert a powerful influence on later action. A favoritism for particular letters often dictates the choice of names and words, thus vitally affecting literary style; while a favoritism for a certain type face may determine directly or indirectly the kind of books and papers one reads. Alphabet friendships are especially potent in childhood. At that time of course they may be in a formative stage, but they early become fixed enough to influence choices in reading. And the choice of reading is certainly a great factor in the later selection of a life work, to say nothing of its relation to character.

As a small boy I divided most of my indoor time between reading the newspaper and producing hand-made papers of my own. Reading, writing, editing, printing taken all together forced me into a very intimate contact with the alphabet, and friendships developed early. Among the capitals I had nine especial favorites—true friends—an even dozen lesser favorites—mere acquaintances—and five letters which I either disliked or disregarded. Of the numerals two were admitted to friendship, the rest were acquaintances, and zero was held in a kind of neutral regard. The small letters were least

favored. None of them were genuine friends. Eight finally became acquaintances, but all the others were socially ignored even though my occupation thrust me into their company daily.

My capital friends were C, E, F, G, J, N, S, V, and Z. The greatest of these was C, with its simple curve, which was both attractive to the eye and easy to draw. But by far the larger part of its prestige was due to pleasant associations; C was the initial of Clifford, my own name, and within my experience were persons of varying intimacy and authority whose names included Clarence, Carl and Charles, while Candlemas and Christmas were two red-letter days of my calendar.

E was the second of my friends, and, like C, it gained much of its prestige by being associated with my social circle, in which there were five Edwards, two Emilies and one Elsie, besides the impersonal "Boston Evening Record," with its large title-line capital E. The names of the months and days of the week were among the first words I learned to spell, and my attention was very early drawn to calendars, almanacs and newspaper date lines where these words appeared in conspicuous capitals. In this way I found further agreeable associations in the E's of September and several other months. The sensuous appeal of the letter was also of importance, for there was a certain visual satisfaction in its sharp straight lines, and I took great delight in making them as sharp and as straight as I could.

F, with a sharp-line appeal similar to that of E, was another letter fortunately associated with myself, appearing twice in Clifford. Among the less important persons were Fales, Fred and a boy-loving neighbor with the initials J. F. February, the only month with an F, was in early years partly given over to a school vacation; and additional vacation associations were furnished by Friday, the last school day of the week.

G gained much by being made like C, and many associations of the one no doubt became confused with those of the other. There was also a peculiar novelty about it, for it appeared in but one month, August, and I saw it little at other times except in the "Boston Globe," which came into the home only one day a week. For flesh-and-blood associates were prominent names within my group—Grace and George.

Next to C my best friend was J. There was a strange satisfaction in drawing and shading its curve and in common print it was a rare letter, thus adding novelty to its intrinsic charms. Among the newspapers was the morning home

paper, the "Boston Journal," an occasional "New York Journal" and—among the magazines—the "Ladies' Home Journal," of which I had formed a very favorable opinion because of my sister's girlish enthusiasm for its covers and stories. There was again the good neighbor J. F., and the July. The straight lines of N won it the sensuous prejudice three months of capital date line appeal—January, June and of E and F. Its date line associations were numerous, comprising NUMBER, SUNDAY, MONDAY, WEDNESDAY, NOVEMBER, JANUARY and JUNE, and both New York and Boston newspaper names. Emphasizing these were the more substantial associations which Thanksgiving gave to NOVEMBER, a day off gave to SUNDAY, and vacation gave to JUNE.

The first and strongest attraction of S was its curves which, though hard to make perfectly, were rather fascinating to twist about the pencil point. The letter also had several advantages of early prejudice; my first serious printing was at the time of the Spanish War, and both "Spain" and "U. S. A." were favorable expressions for practice word lists. This choice was much confused with the glamor of war, and some of my six-year-old patriotism was doubtless imparted to the initial S. Further glamor was supplied by the ancient "Worcester Spy," which my uncle frequently mentioned in speaking of the old days. In the date lines S was found in SEPTEMBER and three days of the week, two of which—SATURDAY and SUNDAY—were of the easy-street class. And settling the fate of the letter beyond all peradventure was its inclusion in Symons, the name of my first great boyhood comrade.

I admired V for its clean-cut point, but its strongest hold was secured through novelty—it was rarely seen except in the VOLUME of the front page date line and in the one month of NOVEMBER. NOVEMBER, as in the case of N, had fortunate Thanksgiving associations. Lesser, but reinforcing factors, were the V in the—VILLE of my town and in the name of Queen Victoria, with its splendid royal associations.

Z won purely on its own merit. Sharp lines, enhanced by novelty, were the only claims to friendship. In my early natural history text excursions the Zebra was a startling discovery, and perhaps some of my awe for that animal became associated with Z itself, but other than this the letter had no external attractions.

My letter acquaintances I regarded as a good but mediocre lot. Some of them boasted a slight native charm in the pos-

session of a graceful curve or rigid lines, but native charm without pleasant associations is not sufficient to establish lasting friendship. I liked A for its similarity to V, and it was happily associated with my name, and with APRIL and AUGUST. A really had good reason to be a friend, but its prominence in the name (ASA) of an uncongenial boy precluded it forever from complete friendship. There were few associations about B and D, and they were not adequate to raise the letters above acquaintances. D, being in my name and in the holiday DECEMBER would have doubtless been more highly regarded had it not been so much like O, one of the five unfriendly letters. O, though in the important months of OCTOBER and NOVEMBER, could never become a favorite, for it was too uninteresting and too hard to draw, since round circles are boyish impossibilities. H was in MARCH and associated with a likeable boy, but its use as an initial in the name of an ill-natured school teacher counted very seriously against it. K was a novel letter and built on sharp lines while it lacked associations; L, on the other hand, was strong in associations and weak in novelty and natural beauty. Four people within my group had initial L's, but L is too plain a letter to be permanently interesting even when clothed in sentiment.

M should have fared better, for it was associated with the patriotism of the battleship "Maine," with the names of five people whom I knew well, and with March. Possibly its unsavory relations with Monday—Blue Monday—excluded it from a more friendly regard. P had neither native grace nor fine associations, and Q was favored only because of its novelty. Many things were pleasantly suggested by R, but most prominent of all were the names of Roy, a neighborly lad, and a Mr. Russell, who had contributed generously to my stamp collection. Like M, R should have been more than an acquaintance, but I had such difficulty in shaping and balancing its various curves that considerable unpleasant sentiment became attached to it. W was closely related to V yet lacked entirely the latter's appeal; while X, though novel and conspicuously associated with the lurid "EXTRA!" of the evening papers, seems to have fallen into partial disgrace through its resemblance to the x of the multiplication table.

Of the neutral or disliked capital letters (besides O), I had no associations, good or bad, and its simple structure made no striking appeal to the sight. T was the victim of bad company, being the initial of two names—of a man and a town respectively—which were in local disfavor. U was uninteresting and without acquired sentiment, while Y, the

last of the unfortunates—though happily bound up in good names—was lost to all friendliness because of its troublesome construction. I suffered more correction in learning to draw the capital Y properly than I did with any other letter in the alphabet.

The numbers were all more or less friendly, though 4 and 6 I held in especial regard. The early contact with the almanac and newspaper date lines had established a prejudice in favor of all numbers. This prejudice was still further intensified by a later and continued admiration of the showy gilt numerals of the railroad locomotives. In a general way I favored even numbers over odd, due chiefly to a superstition acquired from some uneducated grown-up. 1, like I, was too plain, and saved from oblivion only through being associated with my birth year, 1891. 2 was suggestive of February 22 (Washington's Birthday) and my own significant birthday, October 22. I tolerated 3 because it was a number, but I usually passed it lightly on account of its unpleasant relationship with 13.

4, the first of my two greater numeral friends, won its prestige wholly through association. "4:05 o'clock!" was a vital part of my first experience with the "Latest Extra!" while March 4, July 4, and December 24 were all momentous dates of my private calendar. 5 gained somewhat in 4:05 and December 25, but lacked other impressive associations. 6 may have won distinction by its curves, though its leading attraction is traceable in 1896, the year I began to read dates, and to 1860 and the other Civil War years, which my study of battle pictures had firmly fixed in mind. 7 was only an acquaintance because of its prosaic shape, and 8, though curved, suffered a lack of associations, while 9, with several important date associations, was hard to draw and became too suggestive of work.

Although I was constantly using the small letters, as a rule I did not like them. Perhaps it was this very use which robbed them of their novelty and dwarfed any embryonic associations. They were commonplace. A capital seldom appeared more than once in a sentence and a full capital word was something of a marvel. A little sentiment became linked with f, g, r, s, and z, but it was at best merely a residuum of the larger sentiment of their favored capitals.

After following them a few years some letters, particularly capitals, seemed to develop facial and other motor expressions. Many of these expressions were so vague as only to suggest a certain emotion or feeling, but several of them were quite distinctive. Though a factor in friendship, a fancied

facial expression apparently did not influence it seriously, for some friendly faces bore very unflattering marks while some neutrals or dislikes really had smiling, attractive features. The actual shape generally determined a face, but my interpretation of the shape was in some cases slightly biassed by my previous experience with the letter.

The first face having an easily describable expression was that of D, which was proud and haughty. E was rather ugly, ill-natured and inclined to be ferocious at times. G was stout, jolly and smiling; J was matter-of-fact and took life calmly. L was determined yet sensitive, and M sat back with a self-satisfied smile. N was in a perpetual hurry. S, too, was restless and about to leap forward. T, with its drooping top and evil associations assumed a kind of injured, hang-dog air. There was a peculiar freshness about V, but W and X were both nervous and agitated, seeming to move forward jerkily yet without making progress; Z, however, though quick motioned, went along smoothly and was not nervous in the least.

The common Roman Regular Modern style was my first conception of printed type and prejudice was very much in its favor. In the beginning I had a general preference for all Regular Modern faces, but as my experience widened and my mind developed, I came to discriminate between the different kinds of type. Largely because of the newspaper date line associations, the moderately shaded Modern became a source of special admiration. For some years I could appreciate nothing else, but contact with some old books gave me a favorable impression of Caslon Old Style. Regular Modern friendships then extended to Old Style, so that my individual favorites were similar in either alphabet, although Old Style G, J, and Q secured a particularly strong hold because of their more marked divergence from the Modern design. The irregular numerals generally used with Caslon faces at first annoyed me, despite their novelty, but finally I came to enjoy them as much as their Modern brothers.

These two general faces were the only ones that I esteemed highly—all others were "foreigners." Many I did not consider at all, but for some I had a marked aversion. The heavy black Gothic of headlines and cheap advertisements, and the finer Donaldson were my greatest dislikes. With a prejudicial background of two type styles I had become conservative enough to look askance at new designs. At best the heavy Gothic is of doubtful esthetic value, and many laborious attempts at imitation had contributed some odious associations; while Donaldson had been straightway condemned when I

was introduced to it in the pages of a certain very dull magazine.

My earliest expressions of friendship were in the form of aimless word lists. In these Z was often a leading letter, and such words as Zebra were continually repeated; but not infrequently, when my vocabulary proved too cramped to display my favoritism with effect, I would invent jumbled words of my own. At a later time brief Hog Latin paragraphs furnished a means of friendly choice:

Ozt. 31, 1898 Mzn. Lozrfi C. Dzy Gzzbzy.
U.Z. Iz Rzin Aznzmj 23, 1898—Zh czfz Szz W U.Z. Doz's foz Oze Cenz—EZD—Tuedaz Aznzmj:23,98.
SOME OF KINGSURE'S TALK.
Zqj. Z. Q.Xogoz rozk Xthogn znq Zonva
The A.S. pepol are nothing but fools.

Less directly my selection of names signified my growing friendships. The choice of "Journal" for the name of my weekly paper, though partly due to respectful imitation, was greatly influenced by its inclusion of J and N. My imaginary boy's world had a strong political and geographical flavor, and I was lavish in bestowing names on all its make-believe people, towns and countries. With initial C's there were Caledonia, Carelton, Clifton, Contosel, Cornel, Cornelia, Cristina, Chinatun, and Czarinae; with initial J's Janez, Japino, and Messrs. Jakson, Jinks and Jimmy; besides innumerable words with S, V and Z. This very process of choosing names and the self-made imaginative associations growing up about the make-believe people and things further strengthened already existing preferences, and perhaps helped to establish new ones.

My numeral favoritism was also first displayed in meaningless lists. Sometimes twenty or more years would be selected at random and arranged in a column or, again, a number high in the thousands would be followed out through several decades. In these higher numbers there seemed to be a sort of fascination in approaching the end of a century and entering upon a new one; a half-page list of the complete series from 21,784 to 22,815 is characteristic. For more than two years my paper printed regularly a mystic combination of figures which changed from issue to issue. The set taken from the "United States Journal" of January 9, 1899, is an especially striking example of number friendship:

445 21,468
190,444 No. 111

"No. 111" was the serial number of that particular issue, but the others have no reasonable explanation other than

friendly regard. At all times in these early days the "Journal's" front page was little more than a medley of numbers and dates, and for several years I persisted in reducing all personal news to hours, minutes and days of the month:

Willie carried his grandmother to ride Oct. 10, 1899.
Grace went to Ashburnham at 7:15 and she got thereat 8:30 Oct. 10, 1899.
Mr. Osborn took the carpet up in ma's room Tuesday, Oct. 10, 1899.
Mrs. L. E. Day and Mrs. Yeager went to Gardner Tuesday afternoon Oct. 10, 1899.

"Make-believe" circulation figures and the losses of killed and wounded in imaginary battles show numeral favoritism in no less degree. In the play railroad world I displayed my prejudices more strongly. The even numbers were favored by being given only to passenger locomotives, while the odd numbers designated freight and switching engines. Numbers 2, 4, and 8 drew the accommodation trains, but Number 6 went out exclusively with the great midnight and mail expresses.

In later years my letter and type partiality was not so marked, but the friendships continued to serve me, though less and less consciously. If I "browsed" about a library my choice of books was seriously influenced by type styles, and a richly shaded Modern or Old Style face would lead me to look into a heavy exposition where fiction in an unfriendly type would be passed over as dull. Alphabet friendships were no mean factor in determining my present more substantial friendships for certain branches of science and literature. Even today cursory reading often follows in the old paths, and whenever I buy a daily paper in a strange city I invariably pick the one with the most familiar Modern date line, or with the most friendly letters in its name.

NOTES ON THE SCALP AND HAIR

By Clara P. Fitzgerald, M. D.

No one type of personal hygiene appeals to so many people perhaps, as the care of the scalp and hair, and certainly no part of the body is more frequently exposed to disease. In America there are few physicians interested in the scientific study of the subject, while in Europe, in the clinics and laboratories, may be found many earnest workers devoting a great part of their time to this important specialty.

At the St. Louis Hospital in Paris, for example, Dr. Sabourand, of international reputation, holds free clinics every week, reserved exclusively for diseases of the head, and one need only see the immense number of patients there to realize what a real necessity is this department of medicine. The simplest cases are given earnest attention and in doubtful or obscure ones, the well-equipped laboratory in connection with the clinic is a distinct advantage to the patients and post-graduate students alike, because no diagnosis is confirmed until every method known to medical science has been tried.

Besides Sabourand, Doctors Brocq, Darier and Gastou of France and Unna of Germany are some of the noted specialists who have contributed valuable data on the histology, pathology and therapeutics of the hair and scalp.

Dr. Sabourand's unique treatment for ringworm of the scalp has helped to make him justly famous. Where formerly it required months to eradicate this troublesome, contagious disease, the cure is now effected in about as many weeks. The school for "ringworm pupils" at the St. Louis Hospital, Paris, is both interesting and instructive, for here the affected children are obliged to stay until the microscope proves all traces of the infection have disappeared. Teachers are employed by the city so the regular school work is not interrupted and at present the number of pupils averages about one hundred, while formerly two or three times that many were seen.

The important rôle ringworm and other contagious diseases of the scalp play in the school life of many children has been admirably set forth by Edward Millar Steven of Edinburgh in his book on "Medical Supervision in Schools," being an account of the systems at work in Great Britain, Canada, the

United States, Germany and Switzerland, published in London in 1910.

Steven says that in London and other large centers, facilities for bathing and general hygiene are not all that might be desired and the result is that contagious skin affections and pediculosis are only too common. Ringworm is a disease which is conducive to a very large percentage of the exclusions from school. It is estimated that in any given time about 5,000 cases are responsible for a similar number of non-attendances. However, Dr. William Bradford, in his report for 1911, says: "There has been a very marked decrease in the number of cases of ringworm. The decrease is undoubtedly due to the strict exclusion of the children from school until cured and the provision of treatment by means of X-ray."

In Dr. Cruikshank's school clinics at home and school, etc., published in London under the auspices of the National League for Physical Education and Improvement, 1913, will be found very interesting reports on the treatment of cutaneous and other diseases of school children.

If the fungus and its spores are recognized in cases examined under the miscroscope then the case must be excluded from the London schools as infectious. It frequently happens that cases are returned in school certified by medical practitioners as free from disease, generally because no microscopic examination has been made. In 151 cases medical certificates had been given that the children were free from disease and fit to attend school, but in 144 of these ringworm was found; there were three cases of favus and in only four was the destructive organism not found.

Children suffering from ringworm are not excluded from school in New York, but Dr. Sobel, one of the supervisors, who has been working for the department for twelve years and has seen thousands of cases, does not agree with the action of the health authorities in this matter.

In Germany a weekly bath is compulsory for every child attending school, and according to Dr. Cuntz the children show not only a distinct increased capacity for learning but they have very little vermin in the schools—about 1.8 per cent. Contagious diseases of any kind are uncommon judging from the percentage of non-attendance, which is extremely low. The thorough system of medical inspection is by no means better than it is in England, if as good, but skin diseases and vermin are not nearly so prevalent in Germany and it is quite probable that the comparatively few non-attendances can be credited to the excellent provisions made for weekly baths.

Medical inspection of school children is as yet an undeveloped science, says Steven, but should the progress which has taken place during the last ten years be maintained the next decade or two, we shall probably see the banishment of pediculosis from our schools and cutaneous diseases almost eliminated.

As the condition of the scalp and hair in adult life depends largely upon the care of the scalp and hair during childhood and early adolescence the work of medical inspectors in endeavoring to wipe out contagious and infectious diseases of the scalp embodies a two-fold blessing. Dr. David Walsh of Edinburgh has a very good article on the scientific aspects of the prevention of baldness and of certain diseased conditions of the scalp in the Medical Brief, July, 1902, and it deals very intelligently with the importance of early care of the skin and scalp.

Parents owe it to their children to give the same hygienic attention to the scalp and hair as is now so widely and almost universally directed to the teeth. Some favored mortals are inclined to ridicule the alarm less fortunate people naturally feel when the hair begins to grow thinner or the head bald, but the hair is an adornment we can ill afford to lose.

The skin of the scalp resembles the skin of the rest of the body, being a continuation of it, and is composed of hair follicles which contain the shafts of the hair, sweat glands, erector pile muscles (which make the hair stand on end) and sebaceous glands, the last two being appendages of the hair follicle. The hair is in some respects similar to the nails but so formed as to be soft and pliable. The structure of the hair is very complicated and a clear description cannot be given in this limited article. Suffice it to say that the hair has a regular blood supply, very delicate and rather indirect, derived from arterial branches which surround the hair follicle, in the form of a capillary network; and from small arterial loops, which penetrate the papilla from below. Besides the blood vessels are numerous sebaceous glands, which furnish an oily secretion to the hair making it soft and pliable and giving it lustre. This secretion is a constant one in health and is the result of fatty degeneration of the lining cells of the glands, which slowly fill up with the oily matter, burst and discharge their contents. The sebaceous glands empty into the hair follicles in their upper third and are admirably located for lubricating the hair, just before its exit on the scalp. This secretion forms a more or less waterproof coating, the oil being upon the outside of the hair as well as

within it. Sebum acts as a hollow cork, through which the hair passes and prevents the entrance of foreign material into the hair follicle. It is in this substance germs find their way and, because of the constant secretion and excretion of the oily substance, together with the activity of the sweat glands, which encourage rancidity in unhealthy hair; added to the natural warmth of the covered scalp, it is very difficult to dislodge and destroy the invaders.

The skin of the scalp sympathizes with the general system and is impaired by illness, worry, excesses of any kind, exposure to cold and wet, improper diet, constipation, nervous, or general skin diseases, or the hair may be abused by rough handling, over-treatment, lack of cleanliness, careless shampooing, strong soaps, injurious dyes, etc. While no specific can be said to restore the hair, valuable information for the prevention and treatment of scalp diseases has been acquired and many of the various germs which destroy the hair or injure the scalp are now recognized.

Attention to the hair and scalp is of special importance to those who belong to families in which premature baldness is hereditary, but it cannot be given too early. Parents should appreciate the importance of giving intelligent care to their children's scalps from infancy. Upon the first shampoo may depend the future of the scalp and hair and improper management at this time may entail endless worry and trouble to the mother and a great deal of suffering to the child.

Many cases of eczema and severe inflammations are directly attributable to faulty technique of the first shampoo of the newly-born child. On the head of the infant at birth will be found a fatty substance, more or less abundant, called vernix cascosa which is not always easy to remove. Immediately after washing the face and eyes the nurse should apply slightly warmed almond oil, or vaseline, to the baby's scalp and after the rest of the body has been bathed, the head should be gently washed with warm soap suds, or preferably a saturated solution of boric acid powder. If the vernix caseosa proves resistant, force should be avoided, the scalp oiled again and an attempt made the following day to wash off the offending material. For some weeks the infant's scalp should be lightly oiled, as this will prevent any accumulation of seborrheic material commonly called "cradle cap" and besides the oil serves to protect the delicate new skin.

The hair may be washed daily the first few weeks, to prevent rancidity of the oil which has been applied, but later it need not be oiled so frequently, nor washed more than twice a week perhaps. The head must invariably be thoroughly dried after each shampoo.

The development of the hair at birth and during childhood varies considerably in different subjects. Some children are born almost bald while others may have hair several inches long. Generally from six weeks to two months after birth, the long hairs fall out, to be replaced by a soft, downy growth. Some children have very poor scanty hair during their whole infancy, but this is not a bad omen, if not excessive or there is no disease to explain it. When the hair is mediocre at eight or ten, it often develops at puberty and remains good in the adult.

The hair of a girl, if kept short during childhood, should not be cut after puberty, for at this period, when the functions of the body are stimulated to greater activity, the hair takes on a stronger growth and this is the ideal time to treat the hair. Young boys and girls sometimes have lustreless hair and a dry, scaly scalp and ringworm is not suspected until the whole scalp is invaded by the contagious parasite. Ringworm occurs so rarely on the scalp of adults that it is looked upon as an anomaly.

The diet influences the nutrition of the hair, and oatmeal and rye bread are recommended for their good effect, while sugar, sweets and salt eaten to excess, leave the hair brittle, owing probably to absorption of the lime salts in the blood.

If the hair is unusually heavy in childhood it may be invaded by an infection, pityriasis, commonly called dandruff, which gradually causes progressive or paroxysmal loss of hair, so that at the age of eighteen or twenty, the hair is noticeably thinner, and this condition persists through life. A simple, safe application for daily, or less frequent use, is five to twenty drops of castor oil to one ounce of sixty per cent alcohol.

Pityriasis, seborrhea and the so-called seborrheic eczemas constitute a morbid group, which includes half the dermatoses of the scalp, occurring between the ages of fifteen to twenty years in both sexes.

Simple pityriasis is the first stage in the history of baldness and some authorities believe it responsible also for the fading of the hair which brings on gray hairs. Metschnikoff states that grayness is due to microbes which devour the pigment. Pityriasis consists of dry scales sometimes hardly perceptible, with slight itching, more marked during sweating, but with no alopecia, or loss of hair. "So long as the squames of pityriasis fall the hairs do not fall." This condition is very tenacious and requires great patience and constant treatment to overcome it. In the course of time it is transformed locally into alopecic pityriasis with apparently fatty scales. In the adult, ordinarily towards the sixteenth year, the scales of

pityriasis become thick and yellow and less easily detached. The squames fall no more, but then it is the hairs which "fall." The hairs fall off more and more, at first in the summer, but afterwards at all seasons, sometimes in bunches, sometimes gradually. The hairs which fall come out entire, but have a tendency to be replaced by new ones, which, in untreated cases, also fall out. Oily pityriasis should be treated actively for several weeks and then lotions applied for the purpose of keeping the scalp free from fatty material.

In women pityriasis may be worse between twenty and twenty-five, while the hairs fall more rapidly between twenty-five and thirty-five. In men it usually starts at an earlier age. Pityriasis is an insidious enemy to the hair and so slowly but surely does it work that it has caused almost irreparable destruction before the nature of the invasion is revealed.

Seborrhea causing baldness appears clinically, according to Sabourand, as the third stage of the disease, and, as a rule, the younger the subject, the quicker the progress. When it commences at eighteen, for example, it causes baldness at twenty-five, with a fall of perhaps three or four hundred hairs daily. When the seborrhea commences at twenty-five it only ends in complete baldness at about fifty-five or sixty, with a loss of from thirty to sixty hairs daily, varying according to the season. The hairs fall out entire with their bulbs, but are reproduced by other hairs, which fall in their turn, each growth being slower and more scanty, until only a downy growth remains on the scalp.

The treatment of baldness gives only mediocre results, but not none at all, as many believe. The cure of baldness does not exist in the sense of restoring the hair completely, but carefully directed treatment of a seborrheic scalp may retard for many years, a baldness in process of extension. The treatment varies according to the stage of the disease and the toleration of the skin for useful medicaments. The scaly element must first be treated by sulphur or oil of cade ointments applied at night and washed off in the morning. Later repeated soapings every night to remove the sebaceous exudations, the stagnation of which appears to be toxic for the hair, and followed by frictions in the morning with a lotion selected with respect to its adaptability to the particular condition.

For women with long hair where the oiliness is intense, dried oatmeal or rice powder and precipitated sulphur equal parts rubbed into the scalp daily, with frequent washings, may prove helpful.

By careful prescribed measures, varied by the results obtained, the intensity of the disease may be diminished, but

probably in most cases without arresting it completely. However a delay of five to fifteen years in the evolution of baldness may be considered a satisfactory result, in the case of a disease which is so unquestionably refractory.

When there is the slightest doubt about the nature of a scalp disease, a physician should be consulted and if necessary a microscopic examination made. Not only are many scalp diseases damaging to the hair but some are contagious, like seborrhea, ringworm, favus, alopecia, syphilis, sycosis, pediculosis impetigo and other less common ones, and it is very difficult to differentiate sometimes. Any of these diseases could be contracted through the promiscuous use of infected toilet articles or by frequenting unsanitary barber shops.

Blonde, brunette and white hair require different treatments. Agents like resorcin, beta napthol, oil of cade and some other remedies discolor light hair. If the skin of the body is sensitive the scalp is likely to be more irritable. Fine thin hair demands more gentle handling than coarse thick hair. Hair dyes not infrequently cause eczema even in remote parts of the body, and even severe cases of poisoning have been reported.

Excessive friction of the scalp, defective hair pins and combs, unclean brushes, all are injurious, and the best that may be said of most popular hair tonics is that they are useless. The frequency of shampoos must be regulated by experience, the nature of one's employment, the facilities for doing the work properly, the condition of the scalp, the kind of hair, but there is no exception to the rule that the scalp and hair must be kept clean. It may be said that every second or fourth week is sufficient for those not exposed to more than the usual amount of dust, while for those so exposed, every week or even oftener may be necessary.

The practice of daily sousing the head with cold water is pernicious, not because the water itself is harmful but because the scalp is rarely thoroughly dried afterwards. Women are particularly cautioned never to bind or pin up their hair or to comb or brush it while there is the slightest suspicion of dampness whether directly after a shampoo or any other time.

While the quantity and quality of hair is largely determined by heredity, the preservation of the hair and the health of the scalp are influenced materially by cleanliness and good health of the whole body.

SUGGESTIONS TOWARD A STUDY OF MEDIOCRITY

Gustave A. Feingold, Harvard University

Principles of Educational Psychology no longer leave any doubt about the advisability of separating school children into two general classes: the normal and the subnormal. More recent investigations are beginning to justify the segregation of the supernormal also from the average type. This process of putting the backward pupils into a class by themselves and the 'brilliant' ones into another distinct class, ultimately results in leaving behind a large residue, probably 75 per cent of all school children, whom we designate as 'mediocre.' More and more does our attention become fixed upon the two positively selected groups—the stupid and the brilliant. For them we devise special methods of instruction, for them we appoint special teachers, for them we keep special records. But it must be obvious that a great injustice is apt to accrue to the middle group unless we give them also the same careful attention that we bestow on the others.

What do we mean by mediocrity as applied to the intellectual abilities? Surely that term cannot mean 'average' in the ordinary sense of the word. For if it means that, then why should the mediocre person, *i.e.*, the person endowed with average intellectual abilities be regarded with scorn, whereas the person of average height or of average strength is regarded as blessed? Evidently the world does not believe that there ought to be many degrees of differences in intellectual endowments. Qualitative differences there may be; the more, the better. But not differences of extent in any given quality. And we, pedagogues, seem to hold the same view. For do we not group our pupils into five classes only (A, B, C, D, E), according to our system of grading? Yet I warrant that if people were to be graded on the basis of physical achievement, such as running, or jumping or lifting weights, they would fall into more than five classes. Now this seems to contradict the psychophysical law which says that the more numerous the physiological factors involved in a given mental function the larger will be the individual differences in the exercise of that function. On the basis of such a law the

world ought to be willing to 'put up' with mediocrity, and our social engineers should stop pointing the finger of scorn at those that are down low in the intellectual scale.

In spite of this incongruity, however, public opinion is right. No; there should not be many degrees of difference in a given mental capacity. For it should be noted that the above psychophysical law states only half of the truth; because in proportion as the physiological factors involved in a given mental function are more numerous in that proportion will any defective combination be compensated by a new combination. Hence mediocrity is inexcusable. How, then, shall we account for its existence? It must be that there is something wrong with our educational system, And by 'educational system' I do not mean mere school curriculum. Rather do I mean all the social factors—religious, moral, nutritive as well as educational proper—which are involved in the development of the human individual.

Just now we are confronted by a grave social undertaking, namely, the attempt to measure intellectual capacity by some objective standard, and on the basis of such measurement to determine a person's career, his life-plan and his fate. The immediate outgrowths of this desire are to be seen in the two movements of the day—Eugenics and Vocational Guidance. The one promises to supply the proper individual, the other undertakes to locate him in some particularly circumscribed vocational (and therefore social) niche, and to see that he stays put. Both of these movements are excellent in their ultimate aims, but unless our political and economic institutions make a serious effort to set themselves in harmony with the spirit of the age, these movements will not only be out of place, but they will redound in great injury and injustice to the feeble and down-trodden. Not until it has been demonstrated beyond the shadow of a doubt that society is discharging all its duties toward the individual have we a right to interfere or to tamper with that individual's life, freedom and pursuit of happiness. The greatest ills that society suffers from at the present time are not ills which emanate from the perversity of individuals but rather from the laxity and decadence of social institutions; therefore the proper and most expedient way to remedy those ills is to modify the institutions.

A simple instance showing how totally misinformed we still are about human capacities is brought out by the problem of mediocrity in schools and colleges. And in this little paper I propose to show (1) that the term 'mediocre' does not describe the native intellectual capacities of those to

whom we apply it; and (2) that the 'mediocre' or middle group of students is an unstable type, capable of further separation and classification on the basis of achievement, provided the proper guidance, encouragement and stimulus is given.

For some four months I have had occasion to study the progress of 49 college students who were taking an elementary course in Greek Philosophy. It may be safely said that the study of such subjects as philosophy, chemistry or mathematics involves a certain type of learning, the rate of which is measurable within certain limits. To be sure the measurement of progress in such studies as these can not be as accurate as is the acquisition of skill in telegraphy or typewriting, for instance. In the latter case the number of physical and mental coördinations to be acquired are comparatively few and simple; also they are fixed and definite. The key-board has to be memorized, the proper fingers habituated to the proper keys, the right amount of pressure exerted, the copy read and spelled out, and so on. In short, inasmuch as the process is one of habit formation, the rate of learning continues steadily in a straight line. The individual constantly increases his speed and accuracy until he reaches his physiological limit. In this instance the subject matter may be said to be constant while the mental processes constitute the variable that we are trying to determine.

But in learning such a subject as philosophy or mathematics we have two variables: the mind itself and the topic. For surely such a complicated study cannot be said to be fixed and definite like typewriting or ball-tossing. On the contrary, it is continually increasing in complexity; continually unfolding new facts, relations and distinctions which the student must acquire, recognize and discriminate as he goes on with his lessons. How should the rate of progress in such studies be measured? The only way is to see whether the grade attained in their elementary stages is maintained in their advanced states. If it is, then progress is going on. If not—if the grade begins to fall as the complexity of the material increases, then we are justified in saying that the student has reached his intellectual limit for that particular study at the point where the decline occurs. Of course, if the grade happens to be low at the start and gradually rises double progress is shown. This, however, is a rare occurrence.

Now in segregating the dull pupils on the one hand, and the bright ones on the other we proceed on the assumption

that they are fixed mental types. But what about the group we leave behind,—the group that is characterized by the grade C, the 'mediocre' group—is that also a fixed type? If not, is it variable? And if variable what further forces can we bring to bear on it in order to separate its members into their proper spheres?

Method of Procedure

My method of studying this problem was to meet the class of 49 college students either weekly or bi-weekly, and to give them a written test on the subject matter (History of Greek Philosophy), that they were supposed to have learned both from the lectures and from the text-book during the previous week or two. In each of these tests three questions were given: one of a general nature, the other referring to fact, and the third calling upon the creative faculty, *i.e.*, it called for practical philosophizing on the part of the students. Ten tests were given, nine of 30 minutes each, and a final one lasting 3 hours and covering the entire course. The distribution of the grades for the nine short tests and the final three-hour one are given in the following table.

TABLE I

Distribution of Grades

	Order of tests	A	B	C	D	E	Total
	1	9	9	14	8	4	44
	2	6	20	6	8	4	44
	3	1	8	20	16	2	47
	4	1	15	21	6	4	47
	5	2	11	12	11	6	42
	6	6	9	18	7	3	43
	7	6	19	16	5	0	46
	8	3	14	12	5	5	39
	9	4	10	21	8	4	47
Final Test	10	2	5	26	11	4	48
Final Grade		3	10	25	8	2	48

The result of the first test shows a comparatively equal distribution of grades. If we consider the A men as 'excellent,' the B's as 'good,' the C's as 'mediocre,' the D's as 'poor,' and the E men as 'failures' or 'backward,' we find, according to the first test, that there are almost as many 'poor' men as good ones, as many good as excellent, while the mediocre constitute only 30.2% of the total. In the second test, however, a re-alignment occurs; three of the excellent men drop a grade below, whereas eight of the mediocre climb up a peg. In the third test there is another readjustment, and the distribution takes the form which it retains, with but slight variation, throughout the course.

Now why this change? Is it because the minds of the students could not keep up with the increasing complexity of the material they were trying to master? Or is it because the questions set for the successive tests became disproportionately more difficult? Or finally, is it because I began to mark more strictly as the course progressed? The second and third possibilities I tried to eliminate as far as any teacher possibly can. It should be admitted, however, that I marked somewhat liberally on the first and seventh tests. This, however, does not account for the diminution of the A's and B's on the other five tests and for the increase of the C's and D's. Does this mean that the first possibility is the true cause of the change, namely, that the mediocre class results from inability to keep up with the increasing complexity of the material to be learnt? This question can be answered only by making a study of individual cases.

My next step was to investigate the weekly grades of each one of the A men, the B men, the C men, and so on. As there were only three A students and two E students in the final results, I selected three 'typical' men from each of the other ranks for the purpose of comparison. I found that the

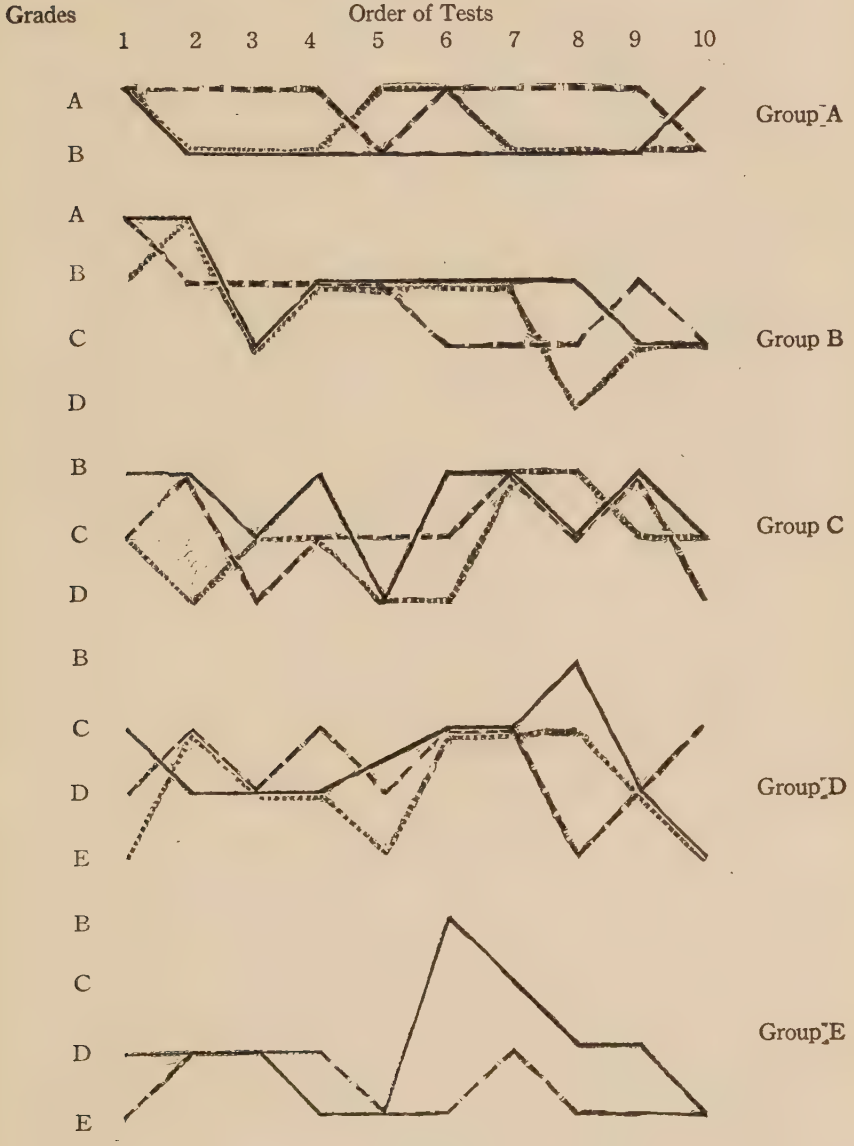
3 A men had	13 A's,	16 B's,	
3 B " "	4 A's,	15 B's,	10 C's, 1 D
3 C " "		11 B's,	13 C's, 6 D's
3 D " "		1 B,	12 C's, 11 D's, 5 E's
2 E " "		1 B,	1 C, 9 D's, 9 E's.

Glancing at this distribution we notice a certain fixity among the A, B, and E students, whereas the C and D men vary considerably. This is best brought out in the following graphs wherein each individual's grade is shown separately.

Degrees of Variation of the Three Individuals in Their Respective Groups

Looking at the curves of the C group—the mediocre men, we notice that not only do the grades oscillate almost uniformly between B and D, but on no occasion, with the exception of one, do all three men receive the same grade on the same week. Now if the mediocre type were fixed then all or nearly all members thereof ought to react uniformly to a given situation, *i.e.,* they ought to vary in any direction together. Such a tendency is observed among the B and E men. The former receive the same grade on three distinct occasions, the latter on four distinct occasions. The D men also receive the same grade simultaneously on four separate occasions. Not so, however, with the C group. Then, too,

Degrees of variation of the three individuals in their respective groups



the total variation is more conspicuous—covers a larger area —within the C and D groups than in any of the others.

Why is it that the 'mediocre' individuals sometimes did well and sometimes badly? Thinking that several of them had received special prompting or tutoring in preparation for some of the tests, and that it was on such occasions that they had received the good marks, inquiry was made among all the men whose grades are plotted here, and it was found that only one individual, belonging to the E group, was tutored on one occasion—for test 3.

It would seem, then, that the individual differences found to obtain among the so-called mediocre men justify the following conclusion, if conclusions may be drawn from such fragmentary data, (1) the middle group students are not mediocre in their mental grasp, but more erratic in their methods of study; (2) since the C group is constantly fluctuating, a closer analysis of it would yield material for the next higher group; (3) it is preëminently necessary that individual attention should be given to the 'mediocre' students as well as to the 'backward' and 'brilliant' ones, because they are in an unstable state of mental equilibrium, and everything with them depends upon the proper stimulus.

THE DOCTRINE OF FORMAL DISCIPLINE

By C. K. Lyans, Clark University

An attempt to discuss the doctrine of formal discipline finds itself balked at the very outset by the question: "What is formal discipline?" The literature on the subject shows a great variety of definitions, but one division between writers comes out with special clearness: those who attack the doctrine have a very different definition of it than have those who defend it. The result is that the opposing sides in the controversy have failed to clash: dispute has tended to magnify their apparent differences, and has minimised their real points of agreement—and there has been great confusion.

To clear the field, I shall take first the definition of the doctrine as seen by its foes, and as seen by its friends, and seek from a comparison of the two views to determine what the controversy has really been about.

(1) As seen by its foes: Two things have especially occupied the attention of those who attack formal discipline—they have seen in it a doctrine that training is transferable, and have found its basis in the faculty psychology. Also, they have seen it as a doctrine having much to do with the selection of studies, and little to do with the pedagogy of instruction: it is to them the weapon of the formalist, used to defend subjects that have lost practical utility. Henderson defines it as meaning "the supposed effect of study upon the mind, entirely apart from the content of what is learned." Monroe reiterates the definition, but amplifies it much further. According to him, the doctrine teaches that "a particular activity or experience, especially of an intellectual character, if well selected, produces a power or ability out of all proportion to the expenditure of energy therein: a power that will be serviceable in most dissimilar experiences or activities, that will be available in every situation, that will be applicable to the solution of problems presented by any subject, however remote from the one furnishing the occasion for the original disciplinary experience." (16, p. 508.) His discussion, again, is followed by Graves (10, vol. 2, p. 309). Since all agree, however, in citing Locke as the

first writer who clearly formulated the disciplinary conception for education, especially in his "Conduct of the Understanding," we have in that work a basis for criticism of such definitions as that just quoted from Monroe. Therefore, before touching on the views of contemporary defenders of formal discipline, I shall give a brief analysis of Locke's doctrines:

(2) As seen by its friends, Locke's "Conduct of the Understanding" contains, though in a rather unsystematic way, some treatment of nearly every factor of the learning process recognized by the most recent psychologists—even to the influence of the attitude or 'set.' We may note the doctrines most significant for our purpose under five heads:

(a) Reasoning. Good reasoning, says Locke, demands a large, sound, roundabout sense, "conversation with many sorts of men, contact with many sorts of books and notions. If one would reason soundly, he should "take a taste of every sort of knowledge: it is certainly very useful and necessary to form the mind."

(b) Improvability of functions. Under this heading comes a statement of what Thorndike calls the laws of use and disuse: Of disuse, "The great number is of those whom the ill habit of never exerting their thoughts has disabled." (1, p. 207.) Of use, "We are born with faculties and powers capable of almost anything, such at least as would carry us farther than can easily be imagined, but it is only the exercise of those powers which gives us ability and skill in anything." (1, p. 190.) He emphasizes, however, the specific character of training—which is the more significant because there was no controversy over the question of specific vs. general training, in his day, and therefore any but a very careful thinker or writer would have been pretty sure to use generalizations which would seem to ignore the specific nature of training, no matter how thoroughly he himself believed that improvement of functions does not transfer. Never having encountered any other view, he might quite naturally take for granted that no other view was held, and feel no need of going into particulars. But Locke did go into particulars. He points out that we learn to dance only by practice in dancing; to think by thinking; and, indeed, that even such a seemingly innate quality as ready wit in conversation is very much the result of practice, "to be raised to that pitch only by repeated actions." (1, p. 191.)

(c) Transfer. Yet Locke does teach that training may transfer, although he has emphasized its original, specific character. This comes out strongest in the case of mathe-

matics, where he even uses the term "transfer." He says children should be taught mathematics so that "having got the way of reasoning, which that study necessarily brings the mind to, they might be able to transfer it to other parts of knowledge as they have occasion." But he sees clearly that this transfer may work for evil as well as good: "A metaphysician will bring plowing and gardening immediately to abstract notions, the history of nature shall signify nothing to him." And again, "Some men have so used their heads to mathematical figures, that giving a preference to the methods of that science, they introduce lines and diagrams into their study of divinity or politic inquiries, as if nothing would be known without them." (1, p. 221.) It is precisely because too wide a transfer of one type of mental habit ensues from a one-sided education, that Locke insists on a many-sided education. He insists—to repeat a quotation already given above—that one should "take a taste of every sort of knowledge; it is certainly very useful and necessary to form the mind." He warns against the uselessness and danger of having only a smattering of everything, and points out the necessity of mastering one's own particular subject, but for one who heeds these warnings, "the end and use of a little insight in those facts of knowledge which are not a man's proper business, is to accustom our minds to all sorts of ideas, and the proper ways of examining their habitudes and relations. This gives the mind a freedom, and the exercising the understanding in the several ways of inquiry and reasoning which the most skilful have made use of, teaches the mind sagacity and wariness, and a suppleness to apply itself more closely and dexterously to the bents and turns of the matter in all its researches. Besides, this universal taste of all the sciences, with an indifferency before the mind is possessed with any one in particular, and grown in love and admiration of what is made its darling, will prevent another evil very commonly to be observed in those who have from the beginning been seasoned only by one part of knowledge. Let a man be given up to the contemplation of one sort of knowledge, and that will become everything. The mind will take such a tincture from a familiarity with that object, that everything else, how remote soever, will be brought under the same view." (1, p. 215.)

(d) Attitude. The quotations already given are sufficient to illustrate Locke's position concerning the attitude or "set" and many more quotations could be given, for his doctrine on this point pervades and colors his whole treatise. He recognizes that one pursuing a given subject develops an

attitude appropriate to that subject; that one whose education, being confined to one subject, has provided him with but one attitude, will apply that attitude to all subjects, from not having learned a better mode of attack; and therefore it is highly desirable to provide in education, through the study of a variety of subjects, as rich a repertory as possible of "sets," so that in dealing with new material—or for that matter, even for the sake of dealing more effectively with the old—the mind may "apply itself more closely and dexterously to the bents and turns of the matter in all its researches."

(e) He insists on the importance for thinking of close attention, pointing out that habits of hasty and desultory work result from its neglect.

This plainly does not square with Monroe's description of the disciplinary conception in education. According to Monroe, that conception teaches that (1) education in one well-selected subject, rather than in many, is best; (2) there is unlimited transfer of training; (3) education in the right subject defies the law of conservation of energy, getting thoroughly disproportionate results: whereas we have seen that Locke, whom Monroe takes as the best representative of this conception; (1) teaches that education should be many-sided; (2) holds a doctrine of transfer differing little from the "identical elements" theory so generally held to-day: and if we take in his doctrine concerning the attitude, Locke's position is wholly reconcilable with that taken by Thorndike, perhaps the leading opponent of the disciplinary idea, in his most recent work. (3) Anything claiming disproportionate results for some particular subject is nowhere to be found in Locke's work.

Turning to Locke's other educational work, "Some Thoughts Concerning Education," we find in his remarks on subjects of study, a corroboration of this interpretation of his doctrine; for his approval or disapproval of various subjects rests almost entirely on practical grounds. Especially noticeable is his discussion of the two subjects around which controversy since his time has raged most violently—Latin grammar and mathematics. He disapproves the manner in which Latin grammar was used in his day, on the ground that the language could be better taught without teaching grammar at the beginning; and the Latin language itself is included in his course of study simply because "it is absolutely necessary for a gentleman"—holding then a place that French has since largely usurped, in England. Speaking of mathematics, he limits the amount of geometry that should

be taught, to six books of Euclid, giving as his reason: "I am in some doubt, whether more to a man of business (*i. e.*, man of affairs) be necessary or useful; at least if he have a genius or inclination to it, being entered so far by his tutor, he will be able to go on of himself." (1, p. 149). There are a few remarks, in the discussion of subjects to be taught, that have a slight disciplinary coloring, but the impression one gains from reading that part of Locke's work, is that he is rather too indifferent not only to disciplinary but even to cultural values, in laying out his course of study.

The fact is, Locke's real contribution is in his emphasis on the improvability of functions—precisely the thing for which Thorndike contends in his "Psychology of Learning"—and his theory is not at all at variance with the doctrine that transfer is a matter of "identical elements." On points of detail there are differences, but they are traceable wholly to differences in analysis, not to contradictions in theory. They only raise the questions: what elements are identical? how are we to decide upon the identity of elements?—questions for which we have nowhere a decisive answer yet. It is further to be noted, Locke never taught that "the process of learning, and not the thing learned, is of importance." That introduces a false opposition—his emphasis was on the point that the thing learned—including the process of learning—is important primarily because of its effect on the mind and character; and mere unassimilated memorial learning is worthless. Monroe recognizes this when he says: "One of the most striking of Locke's positions, as well as one of the soundest of them, is the clear distinction he ever holds in mind between education and instruction." (1, p. 515.) This distinction has become a commonplace of educational thought to-day, thanks to the work of Locke, Rousseau, Herbart, and a host of lesser lights, but it was far from a commonplace in the 17th century—and even with us, it has penetrated but a very little way into the schools.

When we turn to contemporary writers, we naturally find more stress laid on the so-called formal side of education, since this is the point against which the opposition has directed its attack. Wendell stresses the importance in education of developing concentration or will-power, saying that hard work of any sort can develop "increasingly and lastingly muscular power of voluntary attention." (12, p. 31.) Münsterberg argues that in the effort to learn any activity, "the development is specific—the formal training of the will is general." But even the "specific character of the training must not be exaggerated. . . . By training for baseball, we secure general

alertness in our motor responses." He further insists that (1) since every mental function can really be developed, "one side of mental life must not be crippled in the interest of others, as long as general education is in question" and (2) it is of the first importance that the voluntary attention be developed. Our education tends to neglect this, and so makes for superficiality. (12, p. 34-5.) All the other writers who take disciplinary standpoint also emphasize this, that will-power and voluntary attention can and should be developed by education. Judd goes more into detail concerning disciplinary possibilities in the following passage: "We have been in the habit of saying that this or that kind of knowledge is valuable, and we have not really meant this or that kind of knowledge, but this or that subject-matter. I believe it is time for us to take an entirely different view of what is meant by the term *kinds of knowledge*. The ability to reason independently, the ability to retain the essentials and neglect the non-essentials, the ability to carry on certain types of inquiry in any subject-matter, all these forms of ability are more important than the ability to reproduce a body of particular information. The meaning of this last contention may be made somewhat clearer by saying that what we need in our examination of the high-school course of study is a complete restatement of the values of these courses in terms of the mental habits which are cultivated as distinguished from the information which is gained. We are just at the beginning of a period of study of the effects of education." (12, pp. 39-40.)

In these writers, again, we see that the stress is on improvability of functions, as distinguished from, but not necessarily apart from, the subject-matter through which the improvement is effected. As a matter of fact,—though none of the writers quoted has paid much attention to this point—the subject-matter is part of the process of learning, to be taken into account when we estimate the improvement of a function: we apply our knowledge, not mere formal mental powers, to new problems—but that knowledge, to be applicable, must have been assimilated, organized, worked over into something that looks very much like a formal mental ability. "Mathematical ability," for example, is a knowledge of mathematical facts and principles which has become so much a part of oneself that he uses it as naturally as he would use sight and touch. Even "power of observation" involves the possession of facts available for comparison, and of principles—which are also facts—to guide the comparison; as well as an understanding, to be gained only by experience,

of the resources and limitations of the human organism, and of the best methods for attacking the problem to be faced. From one point of view, all this is simply knowledge: from another point of view it is pure mental power.

The second point especially stressed by those who defend the disciplinary ideal, is that the power of voluntary attention, acquired in the strenuous pursuit of any subject, is generally applicable to all affairs of life. But this is only holding that the voluntary attention which keeps a man at work on mathematics is identical with the voluntary attention that keeps him at work on a case at law, or a problem of business administration. Thus, whether or not the holders of the views just quoted accept the doctrine that all transfer is explained by the presence of identical elements in the activity from which and the activity to which the transfer occurs—and most of them, I believe, do accept it—at any rate, their contentions can perfectly well be stated in terms of that doctrine. Indeed, if we read any claim that a certain subject supplies a transferable training, we find it devoted almost entirely to pointing out elements that are in the opinion of its advocate common to that subject and certain other subjects, or certain of life's activities. The defender of Latin grammar and translation work points out the demand which his subject makes upon powers of observation, the mathematician stresses the training of reason; both have much to say about the development of voluntary attention. But by the mode of their argument, they furnish common ground for discussion with their opponents. Prove that the observation which the one talks about, the reasoning power that concerns the other, and the voluntary attention which seems so important to both, are not identical with the activities that bear the same name in other parts of life, and their contention falls to the ground. On the other hand, grant that there is a real identity under the identity of name, and their opponents must grant that training in those activities may transfer, at least. I say "may transfer," because while by this theory all transfer is of identical elements, yet this need not concede that training in identical elements always transfers. Experience gives good reason to believe that it does not. The problem for us to investigate, then, is: "What are identical elements, and what principles control the transfer of training in them?"

I. Experimental Studies

Owing chiefly, no doubt, to the fact that satisfactory methods for comprehensive investigation of higher mental processes have not yet been devised, the experimental data on transfer

are almost wholly confined to tests of what we may call peripheral functions, involving very little of the higher powers of observation and reasoning. Therefore experimental results prove nothing, unless by analogy, about the existence or possibility of transfer in precisely those parts of our mental life where it would be most important. In general, there have been two kinds of studies: (1) studies of transferred improvement of memory; (2) studies in the transfer of sensory or sensory-motor skill. Each of these kinds calls for some general observations, after which I shall discuss in detail a few typical experiments.

I. In the field of memory, any physiological explanation of that function would justify us in expecting to find absolutely no transfer of training. When memory was looked on as a sort of psychic reservoir, into which we dumped facts until we wanted them again, it was quite conceivable that use or training could enlarge the capacity of that reservoir; but when we conceive of memory as merely the tendency of a neurone to retain an impression that has been stamped upon it, the only possible effect of repetition would be to stamp that particular impression deeper, and it is not easy to see how the process would make the neurones constitutionally more receptive or more tenacious of other impressions, no matter how similar in content to the one through which the training was received. This objection holds, no matter which of the current views of memory we take. The only conceivable physiological correlate of a direct improvement of memory, is a change in the actual constitution of a neurone or group of neurones, quite apart from the increased sensitiveness of the neurone or neurones to the stimuli representing the subject-matter which furnished the original training. Any direct improvement of memory as a function, is a case of real transfer, even though it be from the learning of one list of nonsense-syllables to the learning of another. Not only is memory not a faculty; it is not even a group of faculties: there are as many memories as there are things learned; every new thing learned is a new memory. Memory is simply a property of nerve substance, and to change this property would change the substance—unless we want to postulate a psychic element of memory which may change without a corresponding physiological change. But perhaps memory does improve, and the constitution of the neurones does change as an effect of training: I am not concerned either to affirm or to deny such a change, but only to point out that if there is actual improvement of memory through training, it can only be explained as accomplished in that way, and if that occurs we

have a case of not transfer, but "spread" of training, irreducible to the functioning of identical elements. For practical pedagogy, I believe this is a matter of small importance; we have every reason to think that the amount possible of direct improvement of memory, if any at all, is very slight. Far the greater part of all gain in memorial efficiency is more satisfactorily explained as resulting from improvements in the technique of memorizing: finding advantageous devices of grouping and rhythm, improved methods of applying the attention, ways of invoking the aid of association, and in a general way, getting a better understanding—mostly subconscious, to be sure—of the properties of the nervous substance with which memorizing is so predominantly concerned.

The physiological conception of memory has crowded out the conception of memory as a unit faculty, or as a group of faculties, and so makes it impossible that we should speak of any general training of memory, or of any considerable amount of specific training. But at the same time, it gives us a new and sounder basis for a doctrine of general training in memorial technique. If memory is not a faculty functioning as a unit, yet it has a homogeneous physical basis, for we have no reason to suppose that the nervous substance of different parts of the brain obeys different laws. Consequently, so far as improving the technique of memorizing consists in discovering better ways of applying the principles which describe the behavior of nervous substances, just so far is the technique an identical element in all memorial work, and just so far can it function as such. None, I believe, of these general principles is separated out in memorial work from more special adaptations determined by the subject-matter in which the work is done, but a glance at some of the facts concerning the behavior of memory will serve to show the presence of these underlying laws: (a) The influence of the task and the attitude (*Aufgabe* and *Einstellung*). In actual practice, the task and the attitude are different things when one is learning nonsense-syllables from what they are when he is learning poetry; but in both cases, the task of learning so as to reproduce gets a different result from the task of learning so as to recognize the right order of the words. The "set" to remember for five minutes gets a different result from that brought by the "set" to remember for a week. (b) Finding optimal groupings and rhythms, and optimal length of working periods, of intervals between sittings, etc. These vary immensely, from the comparatively short periods required by nonsense-syllables, to the long periods that are favorable with a subject-matter of a kind that

is interesting, familiar, and significant to the learner; but at the bottom in all cases lies the fact that it takes a little time to raise the function to its highest efficiency, and then a certain amount of work is sufficient to bring on the fatigue that reduces efficiency to a fraction of what it is when the function is fresh. There is good reason to suppose that this length of endurance is a constant for any individual, given uniform conditions of health and general bodily efficiency; and that we can work longer at significant material not because the neurones can stand more work of that sort, but because the significance of the material gives any one neurone or group of neurones less to do, spreads the same amount of actual memorial work over a longer period, and allows breathing-spells between. (c) The use of association as an aid to memory. This of course dwindles to a minimum in the case of nonsense-syllables and of any unfamiliar material. To invoke the aid of association, there must be some knowledge in the mind with which associations may be formed: thus the later stages of learning a foreign language become much more efficient than the beginnings, because the basis for associations has been built up. But our interest at present is only in the physiological principle on which the helpfulness of associations for memory work rests. To establish an association with a given impression is equivalent to lowering its threshold. Without the presence of the association, the only stimulus available to reproduce the thing learned is a direct act of will: only an impression of a certain strength can respond to that stimulus—in other words, the threshold of response to a simple act of will is comparatively high. But given the aid of an established association, we have a more adequate stimulus, capable of rousing to response a weaker impression—the threshold of response has been lowered. And the greater the number of associations, the lower the threshold for the given impression becomes, and the less deeply does it need to be stamped in.

This is sufficient to illustrate my point: it is my purpose here only to point out that when we conceive of memory as a function or property of nerve-substance, we destroy the old idea of a general training of memory, but we must also infer in the place of the old idea, a new conclusion, that there are certain laws of learning, based on the behavior of nerve-substance, which are as general as the nerve-substance itself, and therefore function as identical elements in all memory-work, and furnish a medium for transfer of training. It might be added, anticipating what I shall develop more fully later, that the actual amount of transfer

becomes much greater if the functioning of these laws is brought to consciousness, either by good teaching or by the intelligence of the learner himself; but I believe there is always and inevitably some transfer, until the limit of improvability is reached, though the transfer may be obscured or even negatived by mal-adjustment to the new subject-matter in which evidence of transfer may be sought.

Many of the facts about transfer of training in memory are clearly brought out in Fracker's study of the problem, which is one of the best that we have. Preliminary tests were given in memory for (1) poetry, (2) the order of four shades of gray, (3) the order of nine tones of different intensities, (4) the order of nine shades of gray, (5) the order of four tones—the major chord, (6) the order of nine geometrical figures, (7) the order of nine two-place numbers, (8) the extent of arm movement. Tests number 2, 3, 4, and 5 were given by a method which the author describes in the case of the four grays as follows: "The stimulator was arranged to expose each of the four gray disks for one-half second, an interval of one-half second being allowed between each exposure. . . . After the four grays were exposed, a blank remained before the observer for four seconds, then another arrangement of the four grays was given and another blank exposed. When the second blank appeared, the observer responded, giving aloud the order of the first group of four grays. After the third group had been exposed, he responded to the order of the second group, and so on through the series. In responding to the order of the four grays, the observer called the darkest gray, 4; the next lighter, 3; the next lighter, 2; and the lightest, 1." In the tests of nine tones, only four intensities were used, and arranged into groups of nine: for the nine grays, the four shades employed in experiment (2) were used. After the records of the test series had been taken, a training series was taken, using the four tones of experiment (3), and the method just described. Thus the training series was wholly identical in method with the series in the four grays, differing only in the use of tone-intensities instead of shades of a color.

It was found in the course of the training that all but two of the observers recognized a peculiar imagery, out of which a sort of mnemonic method was built. It is interesting to notice that none of them tried to improve their direct memory of the four tones, but all immediately translated the order of the group of tones into terms of position in space, of the serial names "4213," etc., or some other form of representative imagery. This is certainly a case of calling an easier

type of imagery to the aid of a more difficult: it would be interesting to inquire if it was also partly due to a half-unconscious effort to enlist the aid of association. But the important thing for our problem is that we have here in the training series itself the development of what might be called a manufactured transfer. With every one of the observers who recognized a distinct method of remembering, the real training was not at all in memory for the order of four intensities of tone, but in memory for something quite different; and the four tones were only treated as symbols designating the order in which these artificial images were to be arranged. One observer had a system closely related to the content of the tests, for he imaged the loudest tone as close to his ear, the softest as placed some distance off, and the other two in intermediate positions; but another had a purely visual system, made up of different-sized dots arranged in a vertical line. There is certainly no identity between black dots and tones, nor can it be supposed that these dissimilar images function in identical neurones, since no one holds that the visual centers and the auditory centers in the brain coincide: the only real identity is found in the two abstractions of "difference in size" and "arrangement in serial order," which were common to the dots and the tones—that is instead of transference through identical elements, we have transference through community of an abstraction, which is transference by analogy. Such a method is naturally applicable wherever the analogy holds good, provided that no condition is arbitrarily introduced that interferes with the smooth working of the method, as in the case of the four tones different in pitch, where the tones were called "Do, Me, Sol, Do-2," in the responses, instead of being named, "1, 2, 3, 4."

How far this transference by analogy can be applied depends on the intelligence of the individual; on his ability to discover analogies. How far it will be applied depends again on his intelligence, his resourcefulness in devising new methods, his ability to recognize the limits of economy in transference. One observer may struggle along trying to apply his method by forced analogy, in situations to which it is not at all suited, while his more intelligent neighbor, recognizing that his method is wasteful in the new situation, will abandon it for a better method, even at some temporary loss in efficiency. Fracker's results illustrate both these points: that there is gain in transference by analogy, and that there is loss if the transference is carried too far. The former point, as I have shown, appears even in the results of the training series: it appears again in the final test series. Those who

had developed a definite method in the training series, both improved most in the training, and showed the greatest gain in the final tests. Of the final tests, the four grays, nine tones, nine grays, and four tones could be handled by the methods developed in the training series, but the use of names instead of numbers to designate the four tones interfered very seriously with the application of this method to it, as several of the observers testified. The other three of the final tests to which the methods used in the training series could be applied, show in some cases a greater gain than was made in the training series—the training apparently transferred with more than hundred-per-cent efficiency. That there should be no loss of efficiency in the transfer need cause no surprise, for none of the observers was really training himself to remember the order of four tones differing in intensity. They all took the tones as symbols, possessing an obvious serial order, and trained themselves in remembering some sort of images in the order designated by these symbols. Any other set of equally understandable symbols would do just as well, as these experiments show.

The result with the test series of four tones is an interesting illustration of the tyranny of method. It was natural that stimuli so notoriously difficult to image distinctly as differences in intensity of sound, should be translated into other terms, but where the subject-matter is made up of differences in pitch, and such easy differences as the intervals of the major chord, it is unlikely that all of the observers were incapable of learning to work from direct imagery of the sounds, for anyone who can carry a simple tune in his head has sufficiently good auditory imagery to succeed with it. One did try it, but found that the notes tended to fuse into a chord—an unusual experience, surely, in the field of auditory imagery. The others all applied their previously formed methods—unsuccessfully, as I have already noticed, because names were used instead of numbers—and found this, which, for one of even moderate auditory imagery, was intrinsically the easiest of the four tests that resembled the training series, to be very much the hardest. The method transferred, where transference was a disadvantage.

In the tests essentially unlike the training series, the trained observers again showed superiority over the untrained control-group, which suggests that a transferable mnemonic system is not the only factor in improvement. The factors that influenced the essentially dissimilar tests, as Fracker points out, were: (1) the discovery that imagery is helpful. The special imagery developed in training may not itself be trans-

ferable, but experience with it suggests the idea of deliberately employing some kind of imagery. In the training series, imagery had been unconsciously developed, and only recognized later. (2) "The factor of attention and its control seems to be an important one in improvement and transference," being ranked second to imagery, by the observers. (3) Association: but this factor does not come out very clearly in the experiments. (4) Automatisms. These may either help or hinder in transference. They make a method less adaptable, but where the method can be applied in toto, or at least without change in the automatised factors, they are a distinct advantage. The great improvement in the four grays in the final tests, and the small improvement in the four tones, illustrate both points. In the former test, every automatism could be transferred; in the latter, the use of numbers in the response had to be broken up.

II. Sensory and Sensory-motor Skill. By this rather inadequate title I wish to designate the great group of functions —using the word in Thorndike's sense—that have much to do in a rather superficial way with things, and very little to do with ideas, or interpretations of things. Such are Thorndike and Woodworth's experiments on estimating areas and weights, in perceiving words containing certain letters, etc.; Squire's experiments on neatness; and tests made by various psychologists on localization of lines, on discrimination of pitches in tones and shades in colors. Even Ruger's experiments with mechanical puzzles belong mainly in this group, for, while they involve mathematical principles, and might be solved by direct application of those principles, yet it is doubtful if anyone has ever applied that method, and Ruger's observers certainly did not. They simply manipulated the puzzles more or less blindly until they fell on the solutions by accident. Experience became somewhat of a guide, but only in a rule-of-thumb sort of way. I shall consider the data in this field under three heads: (1) motor skill, (2) sensory skill (discrimination, accurate perception, etc.), (3) general—those activities which involve rather ingenuity than either fine motor co-ordination of especially accurate sense-perception.

1: Transference in motor skill. Of the numerous experiments in this field, most seem to have been concerned with transference of improvement in reaction times, where motor co-ordination is of the simplest sort. Most of the others have been of what I might call an "unreal" kind—such as learning to repeat the alphabet forward and backward, then inserting n after each letter (AnBnCn, ZnYnXn) to test for transfer of improvement from those as training series to the test series

AxBxCx, etc. They lead on the whole to the conclusion that the transfer of training in such work is very limited. A test much more comparable to problems of real life was made by Scholkow and Judd, who tested boys of grades 5 to 6 in school, at hitting a target under water. I quote their report: "One group of boys was given a full theoretical explanation of refraction. The other group of boys was left to work out experience without theoretical training. These two groups began practice with the target under twelve inches of water. It is a very striking fact that in the first series of trials the boys who knew the theory of refraction and those who did not, gave about the same results. That is, theory seemed to be of no value in the first tests. All the boys had to learn how to use the dart, and theory proved to be no substitute for practice. At this point the conditions were changed. The twelve inches of water were reduced to four. The differences between the two groups of boys now came out very strikingly. The boys without theory were very much confused. The practice gained with twelve inches of water did not help them with four inches. Their errors were large and persistent. On the other hand, the boys who had the theory, fitted themselves to four inches very rapidly." (15, p. 37.) There is one important difference in method, which no one has observed, between this and all the other transfer-tests yet published. Instead of taking the record of a single test with the water at four inches as the measure of relative improvement for the boys with and the boys without theory, the experimenters gave a fairly long training in the changed conditions, and measured the relative rates of improvement. The record for the first few trials at a depth of four inches is not given, but it would have shown a much smaller gain, at the best, for the boys with the theory, than the record showed as it was actually taken. If we compare the usual method of testing for transfer, with the "method of free reproduction" in association tests, then Judd's method in this experiment is analogous to the "saving method." Besides this point of method, there are two points especially important in the results: (1) without a certain minimum of experience, theory can afford no help; (2) given that minimum of experience, theory is transferable to all analogous situations, to great advantage.

Experience in every-day life bears out this conclusion. That athletic experience can and does transfer with a high degree of efficiency is a matter of common knowledge: experience in football often facilitates the learning of basket-ball; experience in baseball helps in tennis. This observation is not to be ruled out of court on the ground that the person

whose experience seemed to transfer was only better in natural ability, for the one who began tennis, for example, without previous experience in other sports, sometimes proves his superior native ability by ultimately outstripping his opponent whose athletic training had given an initial advantage. The transference can be explained by the theory of identical elements. But I can speak with fuller knowledge in the field of music. Mastery of one instrument does make it easier to learn another, quite apart from the advantage gained by learning to read music and keep time. Mastery of two or three instruments gives a tremendous advantage in the early stages of learning a new one, though after this initial advantage, in which a saving of as much as two years' work may be made, then progress is no more rapid than for one of the same attainments who knows no other instrument. I shall cite one case which I had a chance to observe very carefully. An amateur violinist of good average ability, and given to theorizing on the principles underlying the rules of technique, took a few months' lessons on the piano. In laboratory tests his reaction times were found somewhat slow, and his accuracy in remembering movements of forearm and upper arm was not above the average. But his rate of learning on the piano was at first very rapid, scales were readily learned, independence of finger action, especially required in using both hands at once, was easy, and he acquired within two months considerable readiness at playing loud and soft simultaneously with different fingers of the same hand, and at playing simultaneously legato and staccato—in simple pieces, of course. The correct action for the staccato touch was learned in three lessons. Curiously enough, while the advantage of training had been with the left hand, that hand proved awkward and troublesome on the piano, while the right hand fell quickly into correct habits, and apparently was superior even in strength. This suggests that the direct muscular training acquired on the violin was the least factor in the transference, and that the gain was almost wholly due to a better understanding of the conditions of muscular training: particularly a greater power of sound self-criticism. The student had learned to recognize when an action "felt" right, and where to look for faults when it did not. It is further significant, that he showed least advantage from previous training, in the one place where understanding can least take the place of plodding work in muscular habituation: in learning to estimate accurately the distances on the keyboard for various musical intervals he had little advantage over an untrained student, and had gained but little fluency by the end of his period of study.

2: Transference in sensory skill. It may seem an abuse of words to speak of sensory "skill," since we think of skill as essentially motor: but ability to discriminate shades in color, differences of pitch, intensity, and quality in tone, length and form in lines in figures, etc., certainly is at least analogous to what we call skill in the use of the limbs and muscles. The experimental data in this field are not very satisfactory. Two of the most often quoted studies are that reported by Thorndike and Woodworth in 1901, and that reported by Coover and Angell in 1907. Since they come from what are generally regarded as opposing camps, we may reach something like reliable conclusions by checking them off against each other. Thorndike's experiments tested the gain in accuracy of judging the areas of various-shaped figures from 10 to 100 sq. cm. in size, of rectangles from 140-300 sq. cm. in size, and of various-shaped figures from 140-400 sq. cm. in size: after practising the observers on a training series in estimating the areas of rectangles from 10 to 100 sq. cm. in size. They also reported other experiments with lines and weights, resting on the same principle. The tests in ability to perceive words containing certain letters have to do with quite a different thing than sensory skill, and hence will not be discussed here. The results show an undoubted transfer of training, which the investigators explain as due to (1) acquisition of certain improvements in mental standards of areas; (2) learning to make allowance for constant error. "That there was no influence due to a mysterious transfer of practice, to an unanalyzable property of mental function, is evidenced by the total lack of improvement in the functions tested in the case of some individuals" (27, p. 276). Here we see, what we have already noticed in other fields, that the chief gain is rather in an improved power of the understanding to find short-cuts in dealing with material, than in an increased efficiency of the sense or senses themselves. Our instruments do not improve: we only learn to use them better. Those who do not learn to use their instruments—the muscles and senses—from practice, show little or no transfer of improvement from the practice. Thorndike and Woodworth explicitly recognize this. They remark: "With some subjects in some cases the new ideas or the refinement of old ideas produced by the training seem impotent to influence judgments with slightly different data." (27, p. 395.)

Coover and Angell tested the improvement in discriminating shades of gray, after a course of training in discrimination of intensities of sound. The fact that the control-group actually got worse between the preliminary and the final results, makes one rather uneasy about the reliability of the

results: we should like a little firmer assurance that such is the normal effect in this kind of work, before accepting these results as final. But even allowing for this weak spot in the tests, it is generally admitted that they prove the existence of some transfer: the only dispute is as to how much they show. In explaining the results, the authors say: Improvement seems to consist of divesting the essential process of the unessential factors, freeing judgments from illusions, to which the unnecessary and often fantastic imagery gives rise, and of obtaining a uniform state of attention which is less than the maximum. . . . The factors in this transfer are due in great part to habituation and to a more economic adaptation of attention, *i. e.*, are general rather than special in character." (4, pp. 333-4.) Instead of speaking of the factors as "general rather than special in character," it is less ambiguous to say that they are central rather than peripheral; that the improvement is due to a better understanding of and use of the psychophysical organism—or that part of it involved in the process studied—rather than to a change in the constitution of the organism. Thorndike and Angell are at one on this point, though I believe they do not recognize the fact. Both deny the spread of training—to any great extent, at least—through a change in the physical factors (the muscles and senses), and both stress the importance of the mental factors. Their differences are in the view they take of some of the higher mental functions. For Angell, attention is one function; for Thorndike, it is many: in the one case, it can be thought of as functioning more generally than in the other. Concerning the question involved in this dispute, I shall have more to say later: for the present, the important thing to notice is their agreement that the chief factors in the transfer of improvement found in their experiments, are mental. The senses involved have not become appreciably finer, subtler, in their responses to stimuli, but the mind has learned better how to put them to work, and how to read their reports.

3: General. Transference in problem-solving. Under this heading I shall take Squire's and Ruediger's experiments on neatness, and Ruger's experiments with mechanical puzzles, as typical. Squire found in tests of children in the intermediate grades that efforts to teach the children neatness in the arithmetic papers brought about a marked improvement in those papers, but an actual decrease in both neatness and accuracy in language and spelling papers. The explanation is obvious when we reflect that improvement involves two factors, the will to be neat, and the ability to accomplish neatness. Neatness is not a characteristic virtue of the elementary

grades, and when the teachers would pester the children about their arithmetic papers, the children naturally made up for it by slighting their other work, so long as nothing was said about that. The experiment should have been carried further. By dropping the emphasis on neatness in arithmetic, and turning the attention to the spelling papers, the investigators would almost certainly have found a marked falling off in neatness of the arithmetic papers—though not a complete return to the old standard—and would have found improvement more rapid in the new subject than in the former one. Given the will to be neat, the skill acquired in the work on arithmetic papers can perfectly well be transferred to work on other papers: but the amount of automatic, involuntary transfer from one activity to another is certain to be small. Ruediger partially recognized this fact, and made a series of tests on neatness, in which, besides working actively for neatness in one subject, the teachers continually brought the ideal of neatness before the children, though making no special allusion to the other school subjects. The result was an unquestionable improvement on the average in all subjects, though the improvement was greatest in the subject where it was emphasized. But while these tests found a half-unconscious transfer of the will to be neat, they do not attempt to discover how far skill in neatness can be transferred by conscious, deliberate effort.

Ruger's report on his tests with mechanical puzzles is full of instructive material on the learning process, but only his data and comments on transfer will be noted here. He reports three tests on the transfer of specific motor habits:

(1) "A subject was tested with a puzzle thrown in chance positions, then trained to approximately the physiological limit in handling four special but important positions. He developed no general rule to include his treatment of these special positions. Another subject was trained entirely with chance positions, in a series approximately half the length of the first subject's series. The second tests of the first subject showed no improvement over the initial results, and were inferior to those of the second subject. This failure to profit by the highly specialized training seems to have been due to the lack of a generalized rule of procedure. As it was, each chance position was first reduced to one of the four special positions and then the solution was proceeded with instead of being performed directly." (23, p. 18.)

(2) "A certain puzzle was so arranged that it could be presented in various forms. The manipulations for these various forms could all be comprised under a single formula.

This general formula could be deduced from any one of these special forms. A number of subjects were tried with this puzzle. As soon as skill was acquired in dealing with one form of the puzzle it was changed to another form. The subjects who developed the general formula during the solution of the first form were able to use the specialized habits built up in the first form in the second. Those who formed merely the special habits without developing the principle attempted to carry over the habits without modification and were greatly embarrassed by the change.

(3) "A subject was tested with a puzzle in a given form. Then all the motor habits necessary for the rapid solution of this form were built up by practice in the separate acts of manipulation involved. The elements were organically related in the successive forms of the practice series, so that the practice was not on the separate elements merely but on their connections. At the close of the practice series the subject was given the complete form, which was identical with that of the initial test. This form was not recognized as being related to the practice series, and the habits built up there were not brought into use.

"In general, the value of specific habits under a change of conditions depended directly on the presence of a general idea which would serve for their control."

This is fully in harmony, we see, with the principle already stated, that most, if not all, transfer is central, not peripheral. An idea or an ideal can be readily adapted, adjusted to the new conditions: a motor, sensory, or sensory-motor habit, if highly developed, must be taken over unchanged, or changed at the cost of much effort; while if it is not highly developed, little is gained by its transference. A new habit could almost as easily be built up.

The report just quoted raises the question: why do motor habits sometimes transfer when they should not, and not transfer when they should? The answer is fairly obvious in this particular case: the transfer resulted from a mistaken assumption of similarity in the two cases (see above, Ruger experiment 2); the failure to transfer (Ruger, 3) from non-observance of similarity. When we turn to every-day experiences, however, the problem seems more intricate, for we find cases of transfer occurring even against the will of the agent, and non-transference where the agent is actively trying to bring the habits into play which refuse to transfer. The solution of the problem is, I think, substantially the same as before, except that in place of conscious perception of simi-

larity, we have a more or less unconscious reaction to similarity, which calls up the seemingly most appropriate "set," and with it, the habits which long-continued practice has associated with it: the undesired habits thus called in crowd out the other habits whose transfer is desired. Apparently we can only approach just so close to the groove of an established habit without slipping in, willy-nilly.

We conclude, then, that "improvement of functions" by training is wholly, or almost wholly, central, not peripheral —not a new doctrine, certainly, but one whose consequences have been often overlooked even by those who hold it. Memorial work does not train the memory either as a whole or in part: it merely stamps in certain impressions. Motor work does not train a "motor function"; it only forms certain motor habits, or tendencies to repeat the specific acts that were performed in that work. These habits do not transfer even to the most similar situations unless the similarity is taken for identity; and in that case they transfer unchanged: nor do they have any immediate effect in making other habits easier to form. But in doing motor work, or memory work, we can also observe how it was done, and use the "know how" thus acquired to make our next bit of work more efficient. Experience can teach us how the memory behaves, just as it teaches a mechanic the behavior of his material—wood, iron, tin, or stone—and this understanding of the behavior of memory, muscle, the senses, and thought, constitutes the real and only direct training possible in any of these fields of work. In its applicability, this training is universal, for memory behaves in substantially the same way whether dealing with nonsense-syllables or philosophical prose: the laws of muscle-action are essentially the same whether the work be driving nails or setting a bone. Very few of us are penetrating enough in our analysis of these laws, or judicious enough in their application, to secure this universal transfer: we only accomplish a very limited transfer, because the strangeness of the subject-matter, when we get too remote from the material with which we had our original experience, baffles our attempt to discover the community of underlying principles between the two. It is easier to work up our experience clear from the beginning, again. But the possibility of universal transfer is always with us: how extensive a transfer any one can achieve from a given bit of experience depends on the amount of intelligence which he devotes to the task.

In accomplishing this transfer of training, if one can use habits already formed, as components in the forming of new habits, he saves just so much in the process: thus we have an indirect transfer-value of existing habits. Where one has a countless number of habits already formed, as in the use of the hand and arm, or a countless number of memorial impressions established, as we all have in our mass of knowledge, this transfer-value is of tremendous importance for the formation of a new habit, or the establishment of a new memorial impression: where the transfer is only from one small habit or memory to another, the transfer-value is relatively insignificant. But in any case, the use of intelligence is necessary to realize the transfer-value: habits can rarely be taken over bodily and unchanged. They must be adapted, and in adapting them, one must be able to distinguish essential from apparent similarity and difference in the two situations. A wrong diagnosis results in misadaptation to the new case: habits and parts of habits transfer that should not, and those that should transfer fail to do so.

All but one of the tests for transfer that have come to my notice, have made one serious error in method: that one is the experiment by Judd and Scholkow, mentioned above (p. 357). In actual life, the thing of value is not the gain in efficiency found at the very beginning of a new activity, due to training in something else; but the gain in improvability. Not how much unconscious, automatic transfer has already been effected, is the question of importance, but how much transfer can one effect by the use of intelligence and deliberate effort, given time to adjust himself to the new situation, to seize its points of essential similarity to the old situation, and of essential difference. Therefore, instead of taking the record for immediate improvement in the final test series, as the measure of transfer, experimenters should after the training series, make of the final tests a new training series, and compare the rate of improvement for the trained group and the control group in the final test-training. In experiments involving such things as simple reaction-times, we should expect very little difference, for they give little scope for the use of intelligence: in tests of greater complexity, such as, say, transfer from typewriting to telegraphy, we should expect a marked difference. The more intelligent should at first greatly outstrip the control group, then settle down to a normal rate of improvement, keeping their advantage, but making no further gain over the control group. The less intelligent should in some cases lag behind the control group, from transferring the wrong habits, which would interfere with progress.

LEARNING AND TRANSFER IN GENERAL.

The results found in these experiments are of only symbolic value for education: they do not test the activities that mean most for life, but only very small analogues and elements of the activities and abilities that are supposed to distinguish a leader from a follower, a cultivated man from an uncultivated, a master from a tyro. The bigger question now confronts us: what is education: can one acquire improved power for meeting novel situations, as well as greater familiarity with old ones; can college training fit for business, and if so, how; have different subjects their peculiar cultural value, and if so, in what does it consist? The remainder of my study will be devoted to the principles on which rest the answer to these questions.

Nearly, if not quite, every fact and principle that has any bearing on the question of formal discipline has already been noticed by writers on the psychology of learning. The "one thing needful" is that these facts and principles should be brought together, their relations to each other made clear where they have been overlooked, and the whole reduced to coherence. In attempting this task, I shall follow very largely Thorndike's Psychology of Learning, probably the soundest and certainly the completest work that we have on the subject. For clearness and convenience of reference, I shall preface my discussion with a brief abstract of his account of the mechanism of learning. He distinguishes the following laws of learning:

I. Three main laws of learning.

(a) The law of readiness: When any conduction unit is in readiness to conduct, for it to do so is satisfying; not to do so is annoying. When it is not in readiness to conduct, for it to do so is annoying.

(b) The law of exercise:

(1) The law of use: "When a modifiable connection is made between a situation and a response, that connection's strength is, other things being equal, increased." (26, p. 3.)

(2) The law of disuse: When a modifiable connection is not made between a situation and a response during a length of time, that connection's strength is decreased." (26, p. 4.)

(c) The law of effect: "When a modifiable connection is between a situation and a response is made and is accompanied or followed by a satisfying state of affairs,

that connection's strength is increased: when made and accompanied or followed by an annoying state of affairs, its strength is decreased." (26, p. 4.)

II. Five secondary characteristics of learning.

(a) Multiple response to the same external situation. This is the universal method of meeting a new situation: we try various new responses until we find one that satisfies. In animal learning, the responses are almost purely blind, random movements; in man they may be guided, stimulated, or checked in various ways, but the principle remains the same. It is only though this principle that we can break away from our plexus of habits, meet new situations, and form new habits.

(b) Attitudes or "sets." These determine the general character of the multiple responses aroused by the new situation, and what response will be selected out of those appearing. The relation between the set in a given situation, and the laws of readiness and effect, is very intimate. One's set determines what conduction units shall be in readiness to conduct; and this determines what responses will satisfy or annoy.

(c) The partial or piecemeal activity of a situation. One or other part of a situation may be prepotent in effect: in more popular language, we tend to analyze situations, and respond to those parts only that seem important, or convenient to take first.

(d) Assimilation of response by analogy. "To any new situation man responds as he would to some situation like it, or like some element of it." (26, p. 28.) "Were the situation so utterly new as to be in no respect like anything responded to before, and also so foreign to man's equipment as neither to arouse an original tendency to respond nor to be like anything that could do so, response by analogy would fail. For all response would fail. Man's nature would be forever blind and deaf to the situation in question." (26, p. 29.) To what experience any situation shall appear similar, depends on the man and his previous education. Coal dust has a similarity to diamonds in the mind of a chemist: to an uneducated man it would be similar to something of a quite different sort.

(e) Associative shifting. This depends on the same principle as response by analogy. We readily learn to make the same response to part of a situation that we have done to the whole: and we may come to lose sight of

> the whole in our response to the part. The very existence of language is a result of this principle; the danger against which we have always to guard of mistaking the word for the thing, is the result of a tendency to make the associative shifting too complete.

This analysis of the mechanism of learning may be left without comment, since the points on which it might be challenged are not relevant to the present study: but certain other points in Thorndike's treatment of the psychology of learning, which have a bearing on the question of formal discipline, need to be criticized and supplemented. These are his discussions of (1) habit, (2) thinking, (3) functions, (4) attention. On all four of these subjects Thorndike is vague—purposely, as I take it, from unwillingness to introduce any speculative question or anything of doubtful validity into his book—and consequently I write here in constant danger of misinterpreting and misrepresenting him. But psychological thought has progressed far enough to make possible something like a definite determination of what these four terms should mean.

(1) Habit. "To one accustomed to the older restricted view of habits, as a set of hard and fast bonds each between one of a number of events happening to a man and some response peculiar to that event, it may seem especially perverse to treat the connections formed with new experiences under the same principle as is used to explain those very often repeated, very sure, and very invariable bonds, which alone he prefers to call habits." (26, p. 28.) Not exactly perverse, we might reply, but rather confusing. The difficulty seems to lie in this: Thorndike calls the laws of learning which have just been given, "laws of habit," and then apparently assumes that every process which obeys those laws is a habit. But they are laws of habit only in the sense that they are the mechanism by which habits are formed: every process which obeys those laws has in it the makings of a habit, but has not yet become one. Once let the process became a habit, and several of these laws fall into abeyance. Multiple response, for example, is supplemented by the uniform, unvarying, and even undiscriminating response of the fixed habit; associative shifting can only be accomplished at the expense of the habit; and the principle of assimilation is only a source of embarrassment, unless one is able to adapt—that is, partially break up, and re-form—the habit thus transferred. What, then, is a habit? A habit is a tendency to repeat an action which has often been performed before. So far as the action has become habitual,

it will be repeated unchanged. Habits and memory are essentially one, arising from the universal tendency of the neurones to retain impressions. Habit and memory are static: a habit cannot form itself, nor can it form another habit. The power that forms it must come from outside itself. That power is the whole personality, feelings, impulses, thought: most active of these is thought.

(2) Thought. As habit is a fixed mode of response to an old situation, so thinking is a flexible, tentative response to a new situation, having as its purpose the discovery and selection of the best response. Having found this response, the organism generally turns it into a habit, and leaves thought free to attack another problem. Thought is, in terms of Thorndike's analysis of learning, the action of the principle of multiple response, under the guidance of a 'set:' it is constantly trying to put things together in a new way, looking for new relations, and in this effort, makes use of its previous acquisitions, habits, memories, established associations, as material. No doubt thinking is much more than this, but it is at least this, and we must carefully distinguish between thought, which is active, tentative, flexible, directed toward the new, and habit, which is unprogressive, stereotyped, a mere deposit of the past—though none the less important for that. Thought may abdicate to habit, and in great measure does in most adults—perhaps completely in some—but thought is not habit, though it is such stuff as habits are made of. There are no habits of thought, strictly speaking: what are so-called are habits that condition thought by barring its progress in some directions, and consequently directing it another way; and also habits which constitute the material with which thought works.

(3) Functions. "Let us use the term 'Mental Function' for any group of connections, or for any feature of any group of connections, or indeed for any segment or feature of behavior, which any competent student has chosen or may in the future choose to study, as a part of the total which we call a man's intellect, character, skill, and temperament. By so catholic a definition we shall have a convenient term to mean any learnable thing in man, the psychology of whose learning anybody has investigated." (26, p. 57.) Such a pragmatic use of the term is of course perfectly legitimate, but we shall want to know more definitely whether a function as such has an organic unity, a nucleus in some innate character and a capacity for independent growth, or whether it is a mere 'segment of behavior' chosen more or less arbitrarily, for convenience of study. In the former case we

have a great group of little faculties in the mind: in the latter case the mind would be from one point of view an aggregate of atoms; from another point of view, a unit. If functions are faculties, we should expect much transfer in a small field, but no transfer to other functions: if they are not, then possibility of transfer should be as wide as the mind itself, and the immediate spread of training should be practically nil. Thorndike seems to lean to the latter view, but occasional remarks by him and others of his school suggest a tendency to regard functions as faculties. For example, Ruger asks: "Is there a single function for 'transformations in three dimensions,' or are there numerous special functions?" (*23*, p. 26.) Thorndike and Woodworth say (*27*, p. 248) "the function attention, for instance, is really a vast group of functions": from which but one inference is possible, that there are as many "attentions" as there are other functions, and that each "attention" is attached exclusively to one of these functions, since no function can act without attention. This leaves us in doubt as to Thorndike's position. But considered on its merits, the second view proposed, denying to "functions" any independent, innate origin, seems the preferable. On this hypothesis, a function is to be regarded as a group of habits and a body of knowledge which have a certain unity from serving the accomplishment of one general purpose. It centers, not round an internal, psychic nucleus of some small special ability, but round the external nucleus of an end to be attained. It may, however, acquire a unity and an independent existence much resembling that once attributed to a "faculty," through becoming formed into a constellation or complex. Thus "mathematical ability," if the study is pursued for a long time and without care to relate it to the rest of life, may be organized into a separate complex, dissociated from everything else—it becomes a "water-tight compartment."

One important conclusion partly follows from, partly supports, this hypothesis. It is this: within the field of pure intellect, there are no special abilities. So far as power of thought is concerned, any individual is equally well equipped for mathematics, philosophy, or fiction-writing: the *Anlagen* which determine anyone's special abilities and interests are all extra-intellectual—emotional characteristics, memory-type, motor control, and environment are among the most powerful determining factors. This conclusion rests mainly on physiological and genetic grounds. Physiologically, uniformity of intellectual power within the individual is to be assumed for the same reason that we assumed uniformity of memorial

ability. As memory has for its basis the power of the neurones to resist impressions, so thought has for its basis the conductivity of the nerve-fibers in the brain. The better one's nerve-fibers conduct, the more fertile will his mind be in new combinations—or ideas—and the more often will he be able to hit on a good idea. There is no reason to suppose that this conductivity varies in different parts of the brain, while the fact that in thought we can summon what little we do know in uncongenial fields, and use it as readily on occasion as we can use knowledge from our favorite fields, indicates that the brain is an equally efficient conductor in all its parts. Genetically, it is not easy to see how specializations in the field of thought should occur. We can easily understand sight-centers, auditory centers, speech-centers, hand-and-arm centers; but how explain mathematics-centers and philosophy-centers: or, taking smaller "functions," centers for puzzle-solving, and centers for judging rectangles of approximately a given area? The facts of learning are much more easily explained without supposing such "centers." This explains in a new way the correlations which Hart and Spearman have pointed out, and for which they have postulated a "general factor." Granted that different parts of the brain are equally efficient in the quality on which intelligence depends, they will be correlations without the help of an ubiquitous "general factor."

(4) Is attention one function, or a group of functions If our contention concerning other functions is granted, then attention must be one function, for it is the prerequisite of every activity, and if it does not attach, in separate fragments, to separate innate faculty-like functions, it must attach instead to mental activity in general: that is, it must function as one. Two other considerations support this view, even if we supposed the innate origin which we have just denied, of separate "mental functions." (a) Attention can be concentrated. If there were a great variety of separate "attentions," the amount of attention available for any one function would be strictly limited, and show very little variation. (b) Supposing attention not to be one, the "attentions" belonging to two unrelated functions could work simultaneously without interference in consciousness: the more remote from each other the two functions were, the less would they interfere. Instead of that, we find that we can attend at one instant only to so much material and of such a sort that it can be contemplated as a unit: the more unrelated an idea that tries to crowd in, the more distracting its influence.

The Things That Transfer

I. Knowledge and Ideas. The distinction in meaning between "knowledge" and "ideas" may be caught by comparing the phrases "a learned man" and "a man of ideas." Taking the suggestion from these phrases, we may define knowledge as what one learns from others; and ideas as what he works out for himself. By this definition, what were ideas to Plato or Kant, become merely knowledge to me, unless I reconvert them into ideas by working them out for myself. The distinction is vital, for what we retain as knowledge is never more than what appears on the surface—we can reproduce it all—while what we possess as ideas have behind them the richness of the thought which went into them—the least part of an idea appears on the surface. Consequently, while a bit of knowledge and an idea may look exactly alike, they are vastly different. To Kant, the Critique of Pure Reason represented the fruit of years of thought: a sentence of it might stand for whole volumes. To us, if we only read it to find out what he said, it will be little more than, in Hamlet's phrase, "words, words, words." We can only win from it something of the significance it had for Kant, by getting into sympathy with his point of view, putting ourselves into his place, trying to understand why he held this or that position, and thinking his thoughts over after him. This is the creative reading which Emerson urges upon us. It by no means involves even temporary assent to the doctrines of the author whom we happen to be reading, but it does involve recognizing that he was human 'of like thoughts with ourselves,' and reading his work sympathetically, as the honest effort of a human mind to express the thoughts that came to it.

Both knowledge and ideas are capable of transfer: but knowledge can never transfer of itself. It must first be worked up into ideas—that is, adapted, re-formed and reorganized, for the purpose at hand. We see this impotence of mere knowledge, everywhere: we all know boys whose knowledge of physics coexists with methods in their everyday mechanics that go back to the cave-men; girls to whom chemistry and cooking have no relation. I know one excellent teacher of geometry who on attempting a little amateur carpentry never thought of using the principle of the right triangle to get the length of his rafters and the proper bevel of their ends; but set two timbers up on the sills at what seemed an acceptable pitch, got someone to help hold them, and marked with a pencil where they crossed. A little

thought might have suggested from his knowledge of geometry the principle which trained mechanics, though themselves ignorant of geometry, have been taught to use: but human nature seems prone to make the hands save the head, instead of making the head save the hands. Anything to get out of thinking.

This points to the true nature of the gap between theory and practice, and how it is to be bridged. Theory is a statement of the relations between one bit of experience and another: and as soon as it loses touch with the experience out of which it grew, it becomes meaningless. The "mere theorist" is not even a theorist: he is only a depository of theories worked out by others, which to him are merely knowledge. But he has this advantage over the "practical man" who knows no theory: let him once wake up to the fact that his knowledge has meaning when brought into contact with life, and he has the store of knowledge already to be worked over into ideas—into power. This is a partial justification of the school, for giving so much of its time to teach theories which can find little or no contact with the pupil's present experience. The pupil is not necessarily the worse off for possessing knowledge which does not relate to his present experience: while he is far better equipped for the future time when his knowledge will become significant, and if he is alert, the very possession of knowledge which he cannot relate up to life, will of itself challenge and enrich the assimilation of his school-learning to experience. But this consideration in no way justifies the school in accentuating the break between theory and life. We may frankly recognize that much of the subject-matter of our school studies—even history and geography—will not reach its highest significance to the pupil until years afterward, and that we need not worry over the fact: but we must make so much of it as we can relate to his life, or, if he is an average boy, the idea will never dawn on him that school-learning can be applied to every-day problems. Learning remains to him a thing apart.

II. Attitudes and Ideals. The *Aufgabe* and the *Einstellung,* the controlling factors in all thought, are for that very reason, controlling factors in all transfer. In studies of learning, it is usual to bracket the two as parts of one process, and then focus attention mainly on the *Einstellung*—quite naturally, because only through the *Einstellung* does the *Aufgabe* get results. But in a study of transfer, the distinction between the *Aufgabe* or goal-idea, and the *Einstellung* or "set," must be kept clear.

(a) The "set." The set is the bondservant of the goal-idea, the adjustment which the organism makes in obedience to that idea. Any such adjustment is to be counted efficient only in proportion as it gets the results called for by the goal-idea. But any given "set," if often enough assumed, can become habitual, and so lose its intimate dependence on the goal-idea. Then we have something that looks very much like a formal habit. As in the humbler realm of activity, conscious, deliberate reaction to a new stimulus turns into habitual, automatic reaction to the stimulus after it has been often repeated: so in the realm of purposes and adjustments to them, the purpose at first determines the adjustment, but at last, if we often meet the same situation with the same purpose, the adjustment becomes automatic, and may even conflict with the purpose, while it will certainly persist without the help of the purpose. A page from my own experience, which many another language-student in our country can match, will serve to illustrate. In college, I studied my texts in foreign languages primarily for the purpose of being ready for translation in class. As I gained some familiarity with the languages studied, I acquired the habit of reading merely to make sure that I could translate when called upon, only passages or words that required working out or looking up, attracted my attention. Passages that contained no difficulties were passed by with a sort of subconscious comment, "yes, I can do that;" and without thought of the subject-matter. The result is that since my college days, now that I read for subject-matter, I find it almost impossible to get any connected idea of the content of a book in a foreign language until the second reading, and often the easier the text, the less I get. I acquired in college what Thorndike calls a "habit of neglect"—learning to neglect the subject-matter, because class-work made no call for it—and the habit has stubbornly persisted in spite of constant effort to break it up.

These crystallized sets, which have declared their independence of the parent goal-ideas, are the most important of the so-called "habits of thought." A set, whether become habitual or not, forms during the period of its dominance, the channel within which thought must flow: become habitual, it acts as a unvarying controller of thought in the presence of situations which call up the given set. A single set, or a small group of them, may after a period of long habituation, so dominate the mind that thought dares not and cannot leap their bounds. Thus the mathematician, the historian, the financier, the specialist in any line, may so firmly acquire

a set appropriate to his own line, and be so innocent of any other forms of thought, that he transfers this one lone set of his to everything that he does. More precisely, this habitual set often makes the man unable to see facts and values that lie outside the sphere of his particular work. There are lawyers in whose minds the statute law usurps the place of the moral code: and another case in point is the business man who thought that he had struck a death-blow to literary culture by arguing that knowledge of Shakespeare had never helped anyone to win a speculation on the stock exchange.

The set transfers more readily than other kinds of habit, because it is attached rather to the general outline of a situation than to its full concrete reality: thus a far wider variety of situations occur that are, so far as concerns the elements evoking the given set, identical. For example, one who acquires the habit of contradicting people, needs only to encounter a statement of fact or opinion in conversation, and his habitual set is at once called up. The statements to which he reacts at various times may be as unlike as day and night, yet they are identical in form, both being assertions. Let the medium of conversation be questions, concealing the speaker's opinions, and the habitual set of the contentious person is helpless to act. The reaction was to the form of the remarks, and changing the form, we evade the reaction.

(b) The goal-idea. From its very nature, the goal-idea cannot become habitual. It is essentially an act of will, and though we may habitually do a thing, we cannot habitually will a thing. Just so far as habit enters in, volition drops out: it is no longer needed. So when a set becomes habitual, the goal-idea to which it belonged fades out, and is very often lost sight of. This is a valuable labor-saving device, because it saves us from the necessity of thinking out our purposes anew whenever we meet a situation: but it is also dangerous, if not carefully used. In any occupation which involves much routine—and most do—one is in great danger of making a fetish of things which were originally done for a purpose, but have become so fixed from constant repetition that they are at last done automatically, worshipped as ends in themselves, and may even serve to defeat the purpose which they should have served, but which, now lost sight of, can gain no respect. School discipline, hospital rules, legal procedure, contain endless illustrations of this irrational worship of form due to divorcing the set from the goal-idea.

Sets may be taught; goal-ideas can only be evoked, brought

to consciousness. What one wants is an expression of what he is; but one may not be at all clear as to his own nature, nor as to his own wishes. The great business of education is to help him find himself, to help him to understand what he is, and what are the best means of realizing fully the possibilities of his own nature. One may very easily choose the wrong intermediate goal-ideas, and so defeat the end which he wishes to serve. Education, in preparing him against this, does in a very important sense teach him goal-ideas, but only, as said before, in the sense that it evokes them from his own nature. But school education very largely fails in practice to do this, because it has very little thought of the individual, and still less of such intangible things as purposes and ideals. Routine and facts are its mainstay. It can and does, however, through the knowledge which it gives, furnish a broader basis from which those who have come under its influence can work out for themselves more surely what their aims are and should be; and we must recognize that too much guidance here is as bad as too little. Every one must "work out his own salvation," or he will be the weaker for not having done so.

Ideals are the chief priests in the hierarchy of goal-ideas. What his supreme ideals are no one can say, for they have their roots too deep in the nature of his being. One who could define his ideals could give a complete analysis of his own nature and character: and the unfailing curiosity of everyone about his own powers and his own traits of character, his interest in what others have to say about him, is an index of the uncertainty with which he gauges himself. But if we can never attain a final statement of our ideals, and may even in trying to do so state the very opposite of the truth, yet we can sense them dimly, and feel them with enough certainty to work toward them. Education of the right sort can enable us to become more clearly aware of these ideals which we dimly sense: education of the wrong sort can blind us to them completely. But in any case, everything that we do is at bottom directed toward the realization of these ideals; or was in the beginnings, before it became, as a habit, independent of all aims and ideals, because independent even of the will.

Goal-ideas and sets alike can transfer, but the involuntary transfer of a habitual set is always in response to a formal, superficial identity between situations, which may coexist with a very essential difference in other respects, which makes the transfer mischievous. The transfer of a goal-idea is necessarily voluntary, through discovery of analogies between

situations. It may be often mistaken, but the more clearly one understands his own aims and ideals, the more perfectly adapted will his transferences be. If he learns to think clearly, and gains an understanding of his own purposes in life, he is equipped to meet any situation, not necessarily in the best possible way, but in a better way than he otherwise would; because he is able to bring his past experience, thought, and decisions, to bear on it.

III. Reasoning. Reasoning always involves—and is—dealing with some kind of subject-matter, and consequently requires familiarity with the nature of the subject-matter dealt with, and adaptation to it. The kind of reasoning that succeeds in mathematics, will fail in historical study. It also requires a considerable stock of knowledge in the given field, for reasoning is very much like the process of digestion—it cannot go on without something to digest. But beneath the difference in reasoning processes consequent on difference in subject-matter, and beneath the conditioning fact that we cannot reason without knowledge to base our reasoning on, there is an essential similarity between reasoning processes even in the most unrelated fields. Any extensive discussion of the nature of reasoning would be out of place here, but we must notice what is the effect of practice in reasoning, and when and how it may transfer. Practice may have its effect in three ways: (1) it develops the so-called "habits of thought"—habitual sets, and perhaps "habits of neglect of fatigue and discomfort"—and thus relieves the strain on the voluntary attention, setting it free to focus more directly, on the thinking process itself. (2) It may improve one's familiarity with his subject-matter. This is of the very first importance. As one can only learn by experience to recognize objects under the microscope from the pictures of them in books, so it is only intimate acquaintance with whatever the mind has to consider, that enables it to grasp the significant points, and distinguish and ignore the insignificant. (3) Practice may bring one to an understanding of "how it is done." This is not a matter of habituation, but of grasping the idea that the procedure employed makes a difference in the results. A man of sufficient genius might learn, from a single act of reasoning, enough to build up a whole system of logic—but no one has ever done it, of course. We can, however, supplement what we learn from first-hand experience, with what others have learned: and our books on logic, our scientific induction, our mathematical deduction, enable us to profit by the experience worked out by scores of great men, living generations apart. Practice, then, is supplemented

by what we inherit from the experience of others, to an extent which we wholly fail to realize, in giving us an understanding of method in thought. But it must be clearly recognized that books and instruction can only supplement and guide experience. We learn from them of devices which would not have occurred to us, and we learn to look where without guidance we might not have thought of looking, for significant principles in our own procedure: but a device which we cannot use, a principle which we do not recognize in our own experience, is meaningless to us. We do not learn to reason by studying logic, though it may help us to understand some facts about our reasoning.

Now the question is: How far can practice in reasoning transfer? Taking in order the three main effects of practice just noticed: (2) The " habits of thought " may transfer involuntarily, wherever situations occur that are formally enough like those on which they were formed, to call them into action; or they may be voluntarily transferred and adapted, because found useful. Thus one who has trained himself to think in mathematics, in philosophy, and in biology, deliberately transferring his acquired habits, has in consequence developed habits flexible enough—or rather, perhaps, generic enough—to apply with a great saving of effort to any new field. But if the thinking in all three lines is conducted with no thought of relating the processes, we have " water-tight compartments " again. If, taking the third alternative, one tries to transfer his habits unchanged, he fails in yet another way. Pascal puts very clearly how this works in his own favorite subject: " Geometers never see what is before their eyes. They are brought up among the principles of science, clear and tangible every one; and all the arguments they employ have been carefully tested beforehand. Hence they are puzzled when they have to deal with evidence of a different kind. Here the points are almost imperceptible; they are not so much seen as felt; a man will hardly be got to notice them at all, if he does not do so naturally. They are so numerous and delicate that the very nicest judgment is needed to seize them and draw the right conclusions: for they cannot be set down in order, like the propositions of mathematics. The mind must take them in at a glance, rather than by any conscious process; geometers only make themselves ridiculous when they insist on applying their axioms and definitions to matters incapable of such handling. Not but what the mind does reason about them after a silent, instinctive fashion of its own, beyond the power of most to grasp, and of any to explain."

(2) Familiarity with subject-matter is of course useful only

so far as the subject-matter itself enters into the work of other fields. But we very readily overlook even the extent to which the subject-matter applies: the self-same fact looks very different in school from the way it looks in a business office; and very different at church on Sunday than at work on Monday—and we do not recognize its identity when it puts on a different dress. Consequently we lose valuable transfer-possibilities, learning useful facts only to forget them again, because we did not learn them well enough to recognize them in a different setting.

(3) Far the greater part of transfer-possibilities in reasoning, come under the heading of experience in methods. Even transfer of habits, and of the use of subject-matter, must be presided over by this understanding of the basic principles of thought, to get the best results. By this understanding of the basic principles of thought, I do not mean the kind of conscious evaluation that could be worked up into a book on logic; but rather the instinctive grasp—analogous in a way to vigor of conscience in morals—on which the conscious evaluation of principles must rest, and which can exist without that conscious evaluation. No course of study can infallibly evoke this instinctive grasp: any subject may do it, if the subject appeals sufficiently to the student. Dewey had this partly in mind when he said: "Any subject . . . is intellectual, if intellectual at all, not in its fixed inner structure, but in its function—in its power to start and direct significant inquiry and reflection." (7, p. 39.) At the same time, some subjects are far more effective than others in this respect, owing to their fixed inner structure, *if* they can be made to appeal: because they can afford the student a far wider variety of "significant inquiry and reflection" in a more concentrated form.

IV. Moral Judgments. The teaching of morals is the most baffling of all problems in education, and the few remarks that can be made here can scarcely hope to add much toward its solution: but since transfer in and into the realm of morals is one of the most important things that the doctrine of formal discipline has to deal with, we must face the problem, were it only to confess defeat. In dealing with moral education, one principle may be laid down as fundamental. If, and so far as, we can influence morals through intellectual training, that is, for the school, at least, the best mode of attack. This is true for several reasons. In the first place, it relieves the serious difficulty met in finding teachers who can give direct moral training. A teacher who inculcates, by command of the school board, moral principles which find but

a small place in his own life, can scarcely avoid making the instruction seem a mockery to his pupils: yet in selecting teachers, it would only put a premium on hypocrisy and time-serving, to go into their moral qualifications more minutely than we now do, in demanding that they measure up to certain broad, easily ascertainable standards. The roots of character lie too deep to be reached by any objective tests: and it is so easy to "assume a virtue if you have it not," with sufficient verisimilitude to deceive the average man, that we could scarcely expect moral tests to improve the personnel of the teaching profession, especially since every vigorous character would resent them, and leave the profession by the shortest route, rather than submit. In the second place, there is always danger that direct moral teaching will become either so aridly intellectual that it will have no meaning in terms of action, in the children's minds, and may even rub the bloom of their youthful enthusiasms; or else so sentimental and goody-goody as to repel the sturdier characters, and confirm the others in their priggish tendencies. Again, direct moral teaching must have to do very largely with particular acts. People demand tangible results, and this is the easiest way to get them: and besides, only a rare teacher could deal with anything like moral principles, without talking over the pupils' heads. The result, then, of the usual moral training must be to develop a purely formal morality, consisting merely of particular habits of behavior. An extreme picture of what such moral training can do in an earnest, conscientious man, is seen in Victor Hugo's character portrait of Javert.

If we can reach morals through the intellect, giving a firm basis for a sound morality, but leaving each one to work out his own character, we avoid all these difficulties. Everyone wants and needs, of course, the help of others in forming his character, but he naturally seeks this help personally and privately, not through the medium of class work. Can we find this desired intellectual basis, to be taught in school, for the formation of character? In several ways, I think. First, through the "intellectual conscience." This roots less deeply in sentiment than does the moral conscience, and so is less liable to perversion, and easier to reach. Intellectual honesty, for example, is simply freedom from self-deception. Generally speaking, no one is eager to deceive himself, so the teacher has little trouble in enlisting the will. He needs only to prepare his pupils against the errors into which thought readily falls, and so far as they learn to think soundly, they will be intellectually honest. But one who is honest with himself is far more likely to be honest with other people,

because he has acquired the technique of honesty—and a great part of the dishonesty in the world is due to sheer inability to tell the truth—and because honesty seems to him more a thing to be desired, than to one in whose mind the distinction between truth and falsehood is less clear.

A second way of reaching morals through intellect has already been foreshadowed, in the section on ideals and goal-ideas. The laws of morality are only means to an end: the realization of ideals. One who has learned to orient his intellectual aims by his ideals is the readier to guide his conduct in the same way. Let him link up his moral principles with the rest of his life, and they will gain both in dignity and compelling power. Duty gets a richer meaning; conscience is recognized as a friend to be cherished. This approach, then, through intellect to morals, depends on bringing ideals to conscious recognition, and developing the judgment, as a power of selecting the right means to realize ideals.

A third means of moral influence, less distinctly intellectual, but a purer case of transfer, is through pre-forming moral judgments. We see ourselves as other see us, much more clearly, if we have first contemplated and judged the given act in someone else—even in a character of fiction. The parable of the ewe lamb, which the prophet Nathan used to bring David's crime home to him, is an illustration of this. If, then, through stories, children in school have a chance to judge coolly and without personal bias certain modes of behavior, those pre-formed judgments are there as a basis from which to judge their own behavior. The extent of the transfer depends on how fully they realize the identity between their own acts and the others on which they have passed judgment.

But one caution must be added: if we substitute the approach to morals through the intellect, for the direct approach, no one must infer that all reference to morals should be banished from the schools. It should not be made a subject of formal instruction, because morality at its best possesses a spontaneity and naïveté which formal instruction tends to spoil: but on the other hand, to avoid all reference to it as taboo would be just as bad as the other extreme of lugging it in by force wherever possible. Morality is as natural to humanity as is breathing, and one should feel as little constraint in speaking of the one as of the other. Any departure from spontaneity, in either direction, will throw an atmosphere of unreality around the whole subject, in the minds of most children.

The Mechanism of Transfer

The reader may have noticed that throughout the whole of our study thus far, we have emphasized the fact that under certain conditions, knowledge and training may transfer: it remains to inquire what principles determine whether or not this transfer will come about. These determining factors are two, the one functioning as the medium, the other as the motive power.

I: The Law of Analogy. It is a commonplace to say that one cannot expect to meet any two situations that are exactly alike; yet we are constantly treating situations as identical with other situations which we have already met, and we treat still more situations as sufficiently like something in our past experience to be met in the same way. The moral code, the legal code, and any kind of general rules or principles are only possible because of this tendency. But how and why do our minds come to behave in this way? It is due in the beginning to the fact that we perceive incompletely, and quickly forget even the greater part of what we perceive. Consequently situations that are not alike look alike to us, through our not noticing their points of difference. Some kinds of similarity, as has been noticed earlier in this paper, will set off habitual or instinctive tendencies to respond, without the interference of conscious volition, or even in defiance of it. These give us the pure "functioning of identical elements" which has been so widely held to be the sole explanation of apparent transfer: the elements may not be objectively identical, but they are subjectively so. But as our observation becomes more accurate and our knowledge more extensive, we come to detect differences in situations that once looked alike, and where we once through ignorance treated situations as wholly identical, we now for convenience treat them as in some degree identical, though recognizing them as different. Thus we have the genesis of analogy, the principle which lies at the bottom of all thought, and without which all learning would be worthless, because without it we could not bring what we learn today to bear on the new situations which we have to meet tomorrow. The syllogism, that once supposed instrument of exact thinking and of certainty, is only a formula for reducing analogy to its lowest terms. All inference is transfer, and the transfer may be either of knowledge, as when we infer from the ratio between diameter and circumference of a circle in geometry to the ratio between the diameter and the circumference of the earth; or it may be transfer more strictly of training, as when

we use the principles of construction learned in geometry, in building a house. These are cases of transfer between what we think of as closely related fields: but what we think of as related fields depends very much on custom and the state of our knowledge. Custom cannot create relationships, but it can blind us to those that exist. The relation between biology and psychology was scarcely recognized until after the middle of the last century: and every new application of science to practical life is the discovery of a new relationship, obvious enough when recognized, perhaps, but long unthought-of.

All transfer, then, is accomplished through the recognition of similarity in difference: that is, through analogy. All effective transfer is based on recognition of fundamental similarities, and on making correct adaptations to the accompanying differences. This requires patient, careful thinking, and a sound knowledge of the fields or facts which are brought into relationship. There are relationships everywhere: it is our business to find them, and also not to be deceived by superficial analogies. The type of thinking in philosophy, to take an example, is essentially the same as that used in working out a new hypothesis from experimental studies in science: but few philosophers would, in attempting to transfer their training to the field of science, take care to notice also the differences, and adapt themselves to their new data; and we might name scientists who have been equally unintelligent on their part, and made of themselves bad amateur philosophers. Again, "History repeats itself"—that is, Greek and Roman history, or any other, as well as our own, is full of instructive analogies, but they lie deep down; almost invariably, those who go to history for proofs and illustrations, fix on superficial analogies which neither prove nor illustrate. Analogy, then, is the one sole medium of thought and of transfer, but analogy may go wrong: we have yet to speak of the power through whose action analogy is made to go right.

II: The Constructive Imagination. When one turns from action and perception to thought, he retires to a world of his own, of images and concepts—he commits a sort of retreat from reality. The value of this human ability to substitute thinking—manipulation of concepts and images—for manipulation of things, cannot be overestimated; but it brings us to a halt before the paradox which it involves. To think, we must turn away from objective reality: to discover truth, either new or old, by our thinking, we must keep in constant and continuous touch with objective reality. One whose thought retreats from reality and stays in its retreat, may

become a dialectician, a clever juggler of words and concepts, but he never will become a fruitful thinker even in a small way. All unquestioning acceptance of authority ,and reasoning from it, no matter how true the authority may be, commits this error; for such reasoning is not based on life, and consequently the reasoner himself cannot properly understand what either he or his authority says. It is always true that any great thinker's avowed followers are his worst enemies.

To correct this tendency of thought to become unreal, is the function of the imagination, which I define as the power of mind that brings thought into rapport with reality. Its one dominant characteristic is unswerving fidelity to essential truth: it leaps straight to the significance of what it contemplates; it catches the spirit of facts and events. Ribot, though his treatment of the imagination differs in many respects from that suggested here, notes clearly the principle underlying this. He says of the imagination: "It reveals a power superior to the conscious individual, strange to him although acting through him: a state which many inventors have expressed in the words, 'I counted for nothing in that,'" (20, p. 52). And again, "the moment of inspiration is ruled by a perfect and spontaneous unity: its impersonality approaches that of the forces of nature," (20, p. 86). Ribot is speaking rather of the moment of inspiration in genius: but the same experience comes to all of us, but on a smaller scale, and often unnoticed, because taken for granted. We turn to this impersonal inspiration for truth, because the unconscious never lies: if it did, we should have what Plato calls "the lie in the soul." If we enlist the unconscious in our thinking, and preserve unperverted our ability to read its deliveries, we have truth in our grasp.

To make good our definition of imagination, we must keep the distinction made by Coleridge between imagination and fancy. Fancy is of two kinds: the first kind is simply imagination at play, and produces in literature such works as the "Arabian Nights"; while in dealing with the outside world it may be credited with the creation of caricatures, fantastic designs and structures made for amusement's sake, and our various games. Unlike imagination proper, it is not serious in what it does: and it never forgets the fact. The other kind of fancy results from an attempt to eke out a small bit of imagination by conscious effort, and make it larger: from it flow the group of faults in literature which Ruskin called "the pathetic fallacy"; and in science and philosophy the fault of which amateur and professional students alike are often guilty, of twisting facts to fit theories. We notice that

fancy is not a separate power of mind, but is only either adulterated imagination, or imagination in sportive mood. Only to avoid confusion is it desirable to confine the term imagination to those uses of the faculty which are both serious and sincere.

The imagination is the only power through which new truth, and true analogies, can be discovered. It required a sustained effort of the imagination to give Darwin's data sufficient reality in his mind to suggest the conclusions in the "Origin of Species": it required a no less real, though smaller effort of the imagination to effect a right transfer of knowledge from geometry to house-building, or motor habits from baseball to tennis. Without imagination there may be transfer, but only by accident will it be advantageous. Imagination is the eye of the mind: without it, we proceed blindly. To use another figure, it works with our knowledge like Ezekiel preaching to the dry bones in the desert, when in response to his preaching the bones came together, were clothed with flesh, and became men once more.

The imagination is not subject to the will: we cannot command our moments of inspiration, be they great or small; but we can do so indirectly, by fulfilling certain conditions without which these insights will not come, and then waiting. The first of these conditions is that we saturate ourselves as far as our situation allows, with the kind of knowledge concerning which we are seeking insights; not only because we need the knowledge as material, but because we need the assurance of our own sincerity. The second condition is that we submit to the impersonality which we have already noticed as a trait of imagination. Unless we are willing to follow the truth where it leads, instead of coercing it to lead where we wish to go, the insights which do come will be lost on us. A third condition is a variant of the second: we must not try to strait-jacket our thinking into conventional forms. Forms, though useful, are dead, and moulded on the old. Thought will not always fit the mould, and must be free to take new forms.

To sum up briefly: all learning from experience, all thinking, all inference, is transfer: there are only differences in degree. Knowledge and habits may function as identical elements—transfer in a sort of reflex way—or they may be deliberately transferred, applied, through the discovery by intelligence of analogies, and adaptation to new uses. Analogy is the one and only medium of such transfer: imagination is the power through which true analogies are to be found, and advantageous transfers effected.

Practical

It is commonly supposed that the doctrine of formal discipline has much to do with the selection of school subjects, and little to do with methods of teaching. Certainly many a pedagogical sin has been committed in its name, in the last half-century: many a fruitful reform has been opposed, many a school subject has been maintained in an unfruitful form, lest "disciplinary values" be lost. But if we take Locke's position as representative for the doctrine of formal discipline, these pedagogical sins are to be regarded as perversions grafted onto the doctrine by those who misunderstood it, by those who had a genuine respect and enthusiasm for culture, but were unable to express more correctly its educational basis; and by those, far less numerous, who had "axes to grind," and used the first instrument that came handy. To increase the confusion, other perversions have been mistakenly attributed to the adherents of the doctrine, by their opponents in controversy. If these perversions are taken as representative of the doctrine of formal discipline, then the trend of this paper is away from that doctrine; but if we take the positions of Montaigne, Locke, Herder, as representative, then the theories here advanced are in direct line of descent.

Passing to the practical suggestions that follow from the theories of this paper, they fall into two groups: those having to do with the curriculum, and those having to do with methods of teaching:

I. Principles of teaching. If what we teach is to have any transfer-value—which is almost equivalent to saying, if it is to have any practical value—for the average student, the transfer should be half-made in school. To make the transfer complete is to defeat the purpose of the school, which is to present experience in concentrated form, ready to be expanded and applied in later life: not to make any transfer at all in the school, results in blinding the pupils to the possibility of transfer—in closing their minds to the idea that theories and knowledge learned in school have any bearing on every-day life. The school-subjects, then, should, as Dewey urged, be related to life. Pupils in school must learn many things which cannot be based on their present experience, but a basis in their present experience should be sought wherever possible. A student who has analyzed a bit of his own thinking, will begin to see what logic is all about: one who has studied the growth of plants in his garden, or in the woods, is ready to understand botany. We cannot, as Plato imagined, dispense with the stars and yet study astron-

omy. This relating of subjects to life is not to be secured merely by getting out text-books whose problems and discussions rest on the life of the immediate neighborhood. These will help, but a child can quite easily fail to recognize his own father's farm when he finds it in a text-book, as many of our teachers handle a text-book. The farm-wagon will look like Hector's chariot, after it has gone through the mill of the five formal steps. If the teacher is to relate to life the knowledge which he imparts to his pupils, it must be related to life in his own mind. A teacher of Shakespeare who is himself ignorant of and uninterested in human nature, may produce a few philologists or rhetoricians, but he will never make literature a force in the thought and life of his pupils, which is certainly the sole purpose of teaching literature in the high school. A teacher of physics who would make his pupils more intelligent and efficient in every-day affairs, must himself be awake to the countless illustrations and applications to be encountered everywhere, of the knowledge which he has to teach. We can only teach what we know: if we would teach anyone the uses of the knowledge which we have to impart, we must understand those uses, ourselves.

Since the two great media of transfer are intelligence and imagination, formalism in education is fatal to transfer. Formalism deadens both intelligence and imagination. Instead of encouraging the mind to use all the resources at its command in dealing with material both new and old, it insists that thought shall follow only certain prescribed channels, in a certain prescribed way. This ignores the fact that the best thinking is based on the richest variety of spontaneous suggestions, and the best mind is most fertile in ideas. Thought must have forms, to keep it from straying aimlessly, but these forms exist only for the sake of thought, and it should be free to remake them as it goes along. To condemn a student's work as "wrong" because it is not cast in what the teacher considers the orthodox forms, is utterly unpedagogical. Formlessness is to be condemned, but so long as the student's work is systematic, the forms which he uses may be judged as well or ill-aadpted to his work, and criticized accordingly, but they cannot properly be called simply "right" or "wrong." Where a superintendent commands his principals and supervisors, the principals and supervisors command the teachers, and the teachers obediently command the pupils, that every piece of work must be done in just one minutely prescribed way and no other: there we have the last word in unreality. It makes a fine machine

for exhibition purposes, enables the superintendent to make a beautifully systematized report, and satisfies a certain ideal of mechanical efficiency—but what of the children? Accustomed only to strict obedience, not permitted to follow out their own intellectual tendencies, carefully guarded against the chance to meet intellectual difficulties at first hand—lest they meet them in a way which the teacher disapproves—they are less able to think independently than if they had never been to school; and one who does not think independently, does not think at all. And no thinking, no transfer. The arithmetic learned in school will not be used more than absolute necessity compels; the history will have no influence whatever on the child as a future citizen; the hygiene course will not lead him to care more intelligently for sanitary conditions at home.

The effect of formalism on the imagination is even more serious. Imagination is the most elusive function of consciousness, and only perfect sincerity can induce it to speak, or enable us to hear correctly when it does speak. Formalism attempts to force into artificial and arbitrary channels the one function whose very nature is spontaneity—and imagination will not be coerced. It is well known that children who have been taught to draw, with rule and compass, as it were, in the Kindergarten, show much less artistic merit in their drawings than children of the same age who have not had such training. Any teacher who has tried to make English, or Latin, or geometry, or even botany, live in his pupils' minds, must have been oppressed by the utter inability of their imaginations after eight or nine years of schooling, to seize the meaning of a fact presented in the school-room. The imagination can be touched even then; many a live teacher succeeds in touching it, by making forms only ancillary, and by keeping fresh his own realization of the meaning of what he is teaching: but when a mind has been *eingestellt* against any hint of imagination in school work for years, it is no easy matter to break through the *Einstellung,* and the slightest provocation will restore it to dominance.

Vitality is not the only need in school work: it should also be difficult. This fact demands emphasis because it is a popular fallacy that work to be "interesting" must be sugar-coated, made easy, that the disagreeable must be tabooed: and perhaps some readers might imply that this plea for imagination in teaching involves the same thing. Not at all. One who has in his school career never done anything disagreeable, who has never had to study until he has gained his "second breath," has missed one of the most valuable

results of an education. All the studies of the learning process, as well as universal experience, prove that it is hard and intense work that educates. But there are abundant difficulties in the nature of any subject, without arbitrarily imposing others; and these natural difficulties have the merit of stimulating thought and stirring imagination, while difficulties which the student feels to be arbitrarily imposed, are deadening, and tend to make most of the class feel that thinking is not an important part of education, while they repel the sturdier minds, and compel at best but a sullen acquiescence. Difficulties which are attacked unwillingly, under compulsion, only make the student more dependent on his taskmaster: he tends to lose all ability to set himself tasks and carry them out on his own initiative. But adolescents—as, indeed, most human beings—enjoy facing difficulties that are felt to be worth while, and mastering them. In such difficulties alone is disciplinary value to be found. For this reason, I might pause to add, studies should be prescribed only as a last resort. One works better at a study which he has chosen of his own free will. We must, apparently, in the present state of secondary education, have a large amount of prescription, but it should be recognized for what it is—a necessary evil—and mitigated in every way possible.

II. The Curriculum. Since transfer is possible, and, given sensible teaching, is assured: therefore we may lay it down as a first principle in deciding on educational values, that those subjects whose content is of the widest applicability, are the first to be chosen, where general education is the aim. Also, even in strictly vocational training, the wider applicability of the principles underlying the rules of the trade, should be brought to notice wherever possible. This gives a better control over the rules of the trade itself, has a great cultural value as a stimulus to thought, and most important of all, perhaps, gives the one so educated greater adaptability. In the rapidly changing industrial conditions of the time, no one can foresee with certainty the future of any trade. New inventions, new methods, may make one's training an unsalable article when he has barely finished his apprenticeship; and the more highly specialized his skill, the less adaptable will he be to new conditions, unless he has also kept open avenues of transfer of training, through basing his knowledge and training on general principles, and avoiding the formation of a too rigid set.

It follows from this that pure science is preferable to applied science. Really, pure science should in its teaching

methods approximate to applied science, since, as said before, the transfer from theory to practice should be half-made in school. But the point of view should be that of pure science, which concerns itself about general principles, and the relations between them: not that of applied science, which only lays down rules for the performance of certain acts, and cares not at all why those rules hold good. An empirical formula is a block of offense to pure mathematics; to applied mathematics, one formula is as good as another, if it works. In teaching pure science, the pupil will best understand these general principles if he has arrived at some of them by his own observation: therefore the first approach to a science should be inductive, free from any special apparatus, and innocent of technical terminology. The average boy would stand in awe of a dollar watch if he saw it labelled a chronometer, in a laboratory. The first two or three weeks of a physics course, for example, should be done without either text-books or laboratory; the students should simply be set to studying intently the behavior of familiar things, until they had firmly grasped a few fundamental principles. It would be even better to give this preliminary work, or some of it, at least, in the last week or two of the year preceding the physics course itself, so as to give the pupils something to think about during the summer. In this way the long vacation, which is now very much a period of forgetting, would become a period of learning—of learning of the best kind. Given this informal introduction to the science, then the technical names for the principles that have been observed, can safely be given, and the work with text-book and laboratory begun. To do all the work inductively would gain nothing, and would slow up the course intolerably; but a week of inductive study at the beginning will give a basis of understanding from which the pupils will be able spontaneously to apply their knowledge in understanding and dealing with all sorts of everyday problems, as fast as the knowledge is acquired. They have started out with a "transfer-*Einstellung,*" so to speak, and will work over their knowledge as they go along: without this *Einstellung,* their knowledge remains isolated, and every bit of it that is to be used must be worked over anew, later. Further, this isolation develops a feeling of unreality which is one of the hardest of all mental sets to break up.

A second determining principle in planning a curriculum, is that the student's course of study should contain several different kinds of subjects. The mind will form sets, especially in adolescence, whether we wish it or not; the school

should see to it that a sufficient number and variety of sets should be formed, so that the student is reasonably well-equipped on other sides of his nature, as well as on the side that his future vocation will develop. This is needed not only for his own personal good, but also because every man is a citizen and a member of society, as well as a workman. He is a layman with respect to every vocation but one, and on the intelligent interest of the layman depends practically all progress in every line. Without the pressure of that intelligent interest upon them, professionals in any line become stereotyped, averse to change, and resist improvements that the thoughtful members of their body suggest.

A third principle is that every one's course of study should be so chosen that the different subjects will supplement each other in the kind of work provided. The student should be allowed and induced to do his own choosing, so far as practicable, but in any case, the choice should heed this principle. Every subject has its characteristic effect on the mind, both for good and bad. The effect of geometry as put in the passage from Pascal quoted above, will serve as an example. The course of study should be planned to make these characteristic effects balance each other. Moreover, every subject makes some demand on powers which, because that demand in the given subject is slight and scattered, it fails to develop adequately. Thus, to take an example from advanced study, biology demands, to evaluate its data, precisely the kind of thinking which is the characteristic feature of philosophical study, and it has also to deal at times with conceptions which are central in philosophy. But in the study of biology, this kind of thinking and these conceptions play so small a part, quantitatively speaking, that the biologist acquires little familiarity with them, in his study, and often betrays a surprising incapacity when he has to deal with them; and with it sometimes an equally surprising blindness to his own incapacity. An intelligent study of philosophy—which must also be a sympathetic, interested study of it—would at the same time soften the arrogance and correct the incapacity. The same thing applies, *mutatis mutandis*, to every study. Every specialist, from philosopher to classicist, is likely to be arrogant in his claims, and to be handicapped in his own line through lack of some kind of knowledge and training which is needed, but not adequately provided, in specialized study.

Finally, the school should aim to teach a few things well and thoroughly to each student, not to give a scattering knowledge of a great variety of subjects. Not content, but assimilable content, is what counts in education, and before

knowledge can be assimilated, there must be present in the mind a coherent body of related knowledge. A well and broadly-educated adult can assimilate almost any bit of knowledge in almost any form, with some success; but an adolescent, whose education is only beginning, must have enough of a given study presented to develop it into coherence. If insufficient time is given to the study, nothing is likely to be gained from it but a chaos of mere memorized facts, useless, because unassimilated. Given a nucleus of three or four principal studies, little excursions into other lines are valuable as means of starting centers of apperception, some of which, at least, may be followed up independently later; and as a means of helping the pupils to see how wide and rich the life of the world is. But the work should not all be little excursions, and the excursions themselves should be given by methods less formal than the studies which are especially stressed: set study should fall into the background, there should even be no final grades, no academic ranking, on such work. While such work may have immense potential value, it has no present academic value of the kind which credits should represent, and we only deceive ourselves by pretending that it has. Besides, "working for marks" always diminishes spontaneity, and makes teacher and pupil in a sense natural antagonists: we should welcome the opportunity to abolish marks wherever possible. Thus academic ethics and pedagogic efficiency demand the same thing.

But returning to the point that the students' course should consist mainly in intensive and thorough study of a few subjects: another reason for this is that the preliminary stages of any study are almost purely memory-work, and to get any disciplinary value, or any cultural value, the work must be carried beyond that stage, to the point of a certain degree of mastery. Anyone would recognize that one who has learned to play the piano well is better trained musically than one who has spread his time over the study of twenty or thirty instruments, can play the scale on all, but can do nothing else on any. The latter has spent all his time on elementary details of technique: the former has been able to live and study on planes of musical significance of which the other has no knowledge. We recognize this in music, but in school-study it is overlooked. Even on the well-established principle of the hierarchy of habits, the second year of a subject should have more cultural value than the first; the third than the second. It should be recognized, and never forgotten, that higher mental habits are more generic, are more readily transferable, than lower; and that the fact of

having worked through all or nearly all the stages of the learning process in any one subject, furnishes a basis of guidance in attacking any subject, which basis is often sufficient to cut years off the time required for a new subject.

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HEIGHT AND WEIGHT OF CHILDREN IN RELATION TO GENERAL INTELLIGENCE

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Mental dullness or brightness and general body growth have in the past been associated in various studies by investigators. That on the whole, in groups of children, there seems to be some correlation, is evident. In a study on St. Louis children Porter (9) concluded that bright children are taller than dull children, and that "precocious children are heavier and dull children lighter than the mean child of the same age." Smedley (11) and MacDonald (6) have in substance made similar conclusions.[1]

Problem and Data

If such relation were evident among normal children, would the differing degrees of mentality as exist in children mentally defective be reflected, on the average, in the height and weight of these children? Would we find also a greater variability among such children? With such questions in mind two hundred eighty-eight boys and one hundred forty-one girls of the Indiana School for Feeble-Minded Youth were examined in February and March 1910. Among other tests physical and mental, the strength of grip and dextrality were also taken. This will furnish the data for a study now in preparation.

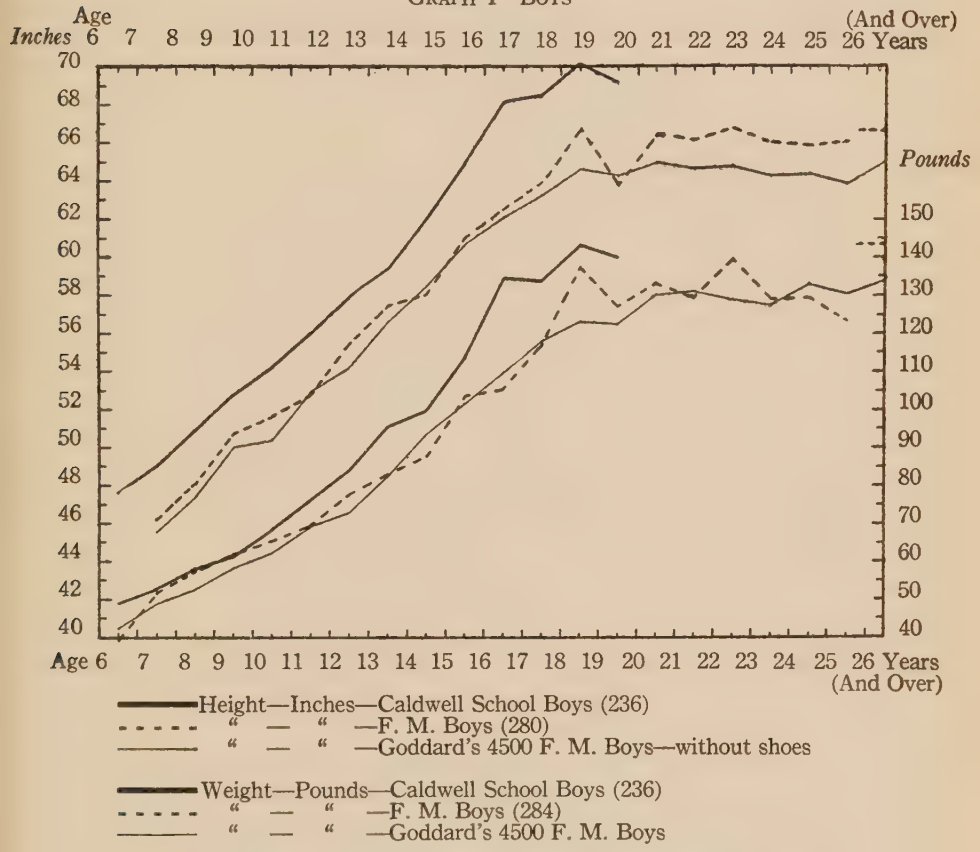
In order to have norms with which to compare normal children and the mentally defective, two hundred thirty-six boys and two hundred forty-five girls of the Caldwell, New Jersey, public schools were measured in May, 1912,[2] as to the same traits by the same examiner and as nearly as possible under the same conditions. The height was recorded with shoes in both groups; the weight, with ordinary cloth-

[1] For a condensed summary of several investigations, see Whipple (14) pp. 47-60. West (13) reaches an opposite conclusion. His classification of children was on the teacher's judgment, while Porter's was the school grade in comparison with age.

[2] For the use of the schools, the author is indebted to Superintendent D. C. Barnett and the Board of Education.

ing. All measurements and all calculations have been made by the author himself. The factor of variability has been reduced to the minimum. The ages are given in years and months. In reckoning the age from birth, from one to fifteen days inclusive were dropped, and from sixteen to thirty were added to the month.

GRAPH I—BOYS



The defective children were classed from the experience and association of the teacher, attendant, and principal, into A, B, C, D, E grades. These would group approximately into the common institution classes of morons (A-B); imbeciles (C); idiots (D-E).[3] On account of the few cases,

[3] The moron has a mentality comparable to that of the normal child of from eight to twelve years; the imbecile, three to seven years; the idiot, two years or under. See Goddard (5) p. 221.

the tables and charts which follow show two grades of intelligence, the morons in one group, and the imbeciles and idiots in the other, in comparison to the normal group. The group of total defectives also is given. The individual measurements of each child are grouped according to sex, age,[4] grade, and number of cases, with averages and deviations,[5] in Tables 1-4. The curves representing these data show in Graphs 1-5.

TABLE I

BOYS' HEIGHT—INCHES. (WITH SHOES)

Age	Grades A and B Moron		Grades C, D and E Imbecile and Idiot		Total Defectives			Normal		
	Cases	Average	Cases	Average	Cases	Average	A. D.	Cases	Average	A. D.
6			1	40.80	1	40.80		8	47.57	1.9
7	5	45.76	3	46.83	8	46.16	2.4	14	49.01	1.5
8	10	48.49	4	47.12	14	48.10	1.4	32	50.94	1.9
9	10	51.61	4	48.65	14	50.76	2.1	29	52.67	2.3
10	11	52.46	7	50.47	18	51.68	1.6	18	54.16	2.2
11	13	53.89	9	51.20	22	52.79	2.4	19	55.99	2.4
12	10	56.51	8	54.36	18	55.55	3.1	24	57.92	2.2
13	11	58.18	6	56.28	17	57.51	3.4	14	59.37	2.8
14	14	60.04	11	55.43	25	58.01	4.2	25	62.06	3.0
15	15	63.01	8	57.50	23	61.09	4.5	26	64.99	3.0
16	8	65.75	9	59.52	17	62.45	3.8	17	68.17	1.7
17	4	65.77	6	62.68	10	63.92	4.2	6	68.53	2.0
18	5	67.00	2	66.20	7	66.77	1.7	3	70.20	1.1
19	3	67.07	6	62.05	9	63.72	3.6	1	69.30	
20	3	67.97	6	65.83	9	66.54	1.5			
21	1		7		8	66.21	1.4			
22	0		5		5	66.80	2.6			
23	4		10		14	66.04	1.8			
24	0		2		2	65.85	3.5			
25	1		4		5	66.12	2.0			
26-48	9		25		34	66.69	2.2			
	137		143		280			236		

INTERPRETATION OF GRAPHS

In all the graphs the age appears at the bottom and also at the top. On the average, the age will fall near the half year. The scale of inches is marked on the left margin; the scale of pounds, on the right. The upper group of curves represent height; the lower group, weight. The accomplishment in either trait is read from the same age point.

It should be noted that in the group of Caldwell school children a relatively high grade of children has probably been chosen. It is a little city of some five or six thousand,

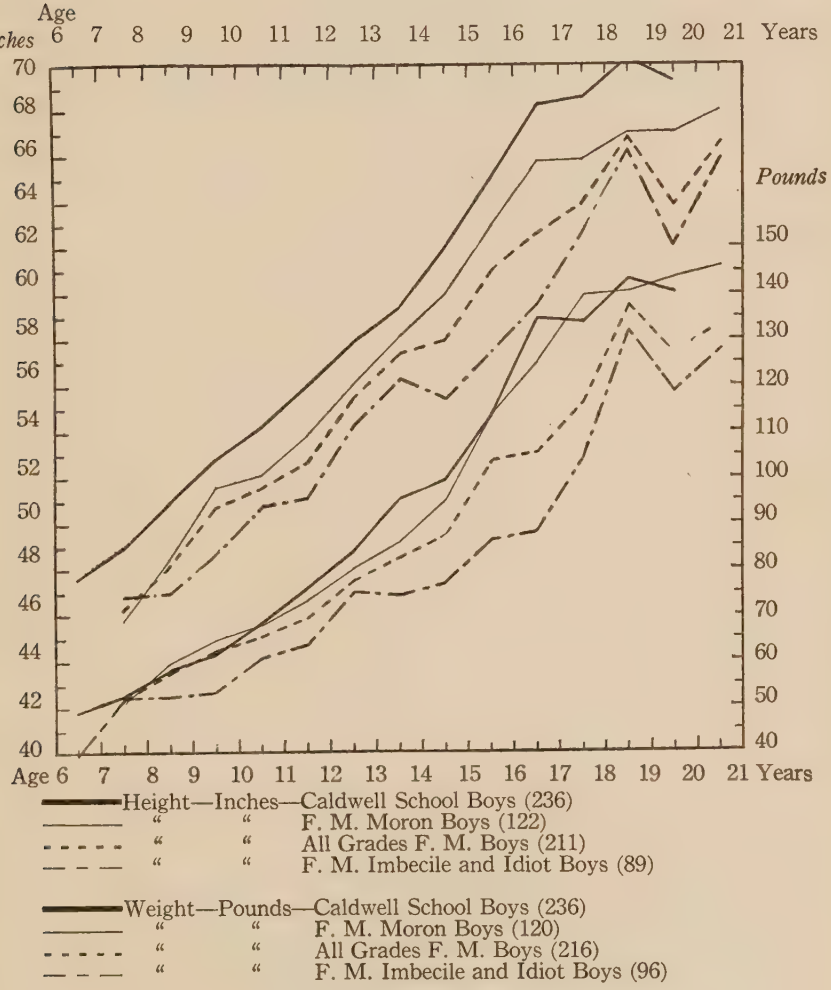
[4] Six years of age means from six to seven.

[5] In calculating the average deviation, decimals from one to six tenths were dropped, and those above added.

about an hour from New York City, and is a most healthful place with the advantages of country life.

From Graph I we see the Caldwell boys higher at each age by from two to five inches than feeble-minded boys, the

GRAPH II—BOYS



difference increasing somewhat gradually with age. All cases of feeble-minded over twenty-six years were grouped and the average height and weight both appear at the right margin, the average height of adult feeble-minded over

twenty-six years being about 66.7 inches. The light continuous line of the upper group shows the average height of about 4,500 feeble-minded boys, six to twenty-six years of age, without shoes, as compiled by Goddard (5)[6] in 1912. Allowing an inch for shoes, the general similarity of the two curves is evident.

The curves for weight are not as smooth as might be wished, a greater number of cases would of course tend to make them more regular. For ages seven to nine the two curves approximate, feeble-minded boys at nine years show-

TABLE II

BOYS' WEIGHT—POUNDS. (ORDINARY CLOTHING)

	Grades A and B Moron		Grades C, D and E Imbecile and Idiot		Total Defectives			Normal		
Age	Cases	Average	Cases	Average	Cases	Average	A. D.	Cases	Average	A. D.
6			1	39.00	1	39.00		8	49.12	6.5
7	5	51.80	3	52.33	8	52.00	6.0	14	52.82	4.6
8	10	59.60	3	52.33	13	57.92	4.0	32	58.04	5.2
9	10	64.90	4	53.75	14	61.71	7.3	29	61.39	8.0
10	11	68.27	10	60.70	21	64.66	5.8	18	68.51	8.7
11	13	73.30	9	63.88	22	69.45	7.4	19	76.31	12.2
12	10	80.30	9	75.11	19	77.84	12.0	24	84.03	12.7
13	11	86.00	5	74.80	16	82.50	12.1	14	95.53	18.2
14	14	95.21	12	77.16	26	86.88	19.6	25	99.57	14.8
15	14	113.85	8	86.25	22	103.82	19.9	26	113.63	16.7
16	8	125.25	10	88.20	18	104.66	22.1	17	134.52	12.4
17	4	139.75	7	104.14	11	117.09	26.3	6	133.83	11.5
18	4	140.25	2	132.00	6	137.50	8.8	3	143.16	10.5
19	3	143.66	6	118.66	9	127.00	29.8	1	140.00	
20	3	146.00	7	127.86	10	133.30	17.3			
21	1		7		8	129.50	7.2			
22	0		5		5	139.40	18.4			
23	4		10		14	129.07	13.6			
24	0		2		2	129.50	13.5			
25	1		4		5	123.80	19.8			
26-48	9		25		34	143.80	18.4			
	135		149		284			236		

ing a little heavier than normal boys. After age ten normal boys are consistently heavier than defectives by from five to fifteen pounds, the difference increasing in a general way with age.[7] The adult weight for thirty-four boys over

[6] This work is by far the greatest ever done and sets norms for years to come for the feeble-minded in height and weight.

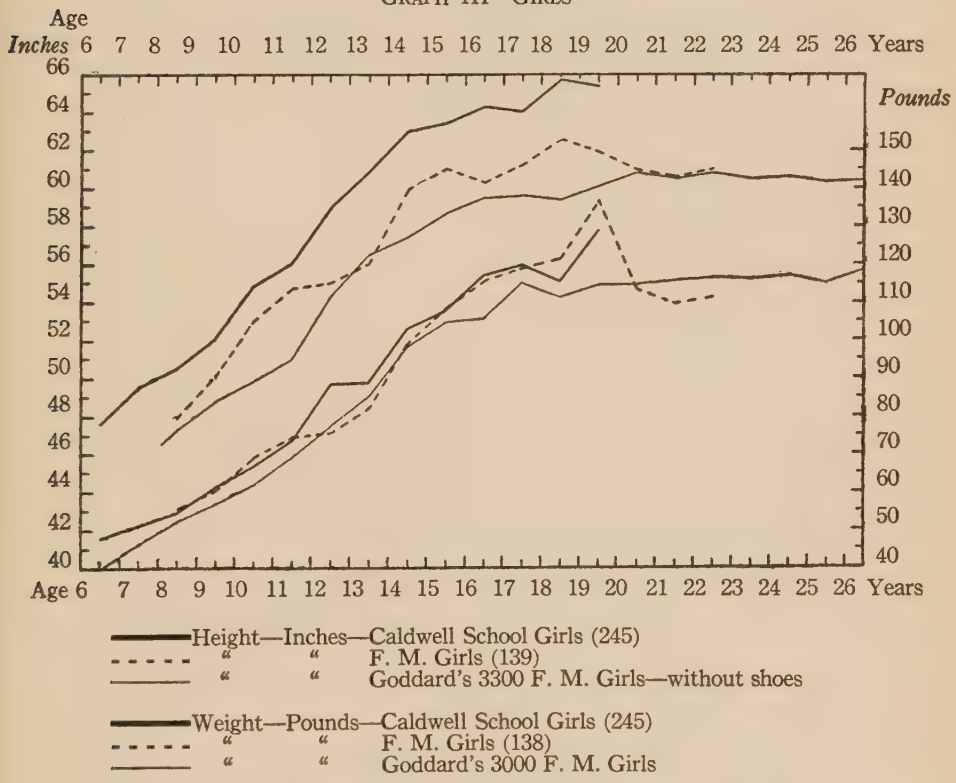
[7] Tarbell (12) says: "Feeble-minded children (boys and girls) are about two inches shorter and nine pounds lighter than normal children of the same age."

Goddard (5) p. 229 says: "If, however, we take the line representing defectives of all grades, we find that while 'he is not two inches shorter and nine pounds lighter' he nevertheless is one inch shorter and two pounds lighter up to the age of fifteen. After that he is three inches shorter and twelve pounds lighter."

twenty-six shows 143.8 pounds. The sedentary institution life and more regular dieting and sleep tend toward weight, especially in the more imbecile cases. The same might be said of all grades in the earlier years. Goddard's curve for weight for about 4,500 feeble-minded boys, six to twenty-six years of age, is shown in the light continuous line below.

Graph II shows again the curves of height and weight

GRAPH III—GIRLS



for normal and defective boys as separate groups and in addition, the defectives divided into two groups, the higher grade moron, and the lower grade imbecile and idiot. The heavy line in either group is the normal; the light line, the higher grade defectives; the broken dash line, all defective boys of this study; the broken dot and dash line represents the lower grade imbecile and idiot as a group. This graph shows the imbecile and idiot boy lower in stature and less

in weight than the group of feeble-minded boys in general, excepting age seven. It shows the higher grade moron taller and heavier at each age, excepting seven, than the defective group whole. In weight the moron group more nearly approximates and at places exceeds the normal. At no age in height, and at no age in weight excepting 8, 9, 17, and 19 years, does the high grade mentally defective boy reach or exceed the average normal boy of six to nineteen years in these traits.[8] These exceptions may very probably be due to the few or exceptional cases, and the author wishes it

TABLE III

GIRLS' HEIGHT—INCHES. (WITH SHOES)

	Grades A and B Moron		Grades C, D and E Imbecile and Idiot		Total Defectives			Normal		
Age	Cases	Average	Cases	Average	Cases	Average	A. D.	Cases	Average	A. D.
6								9	47.60	1.4
7								17	49.53	2.3
8	1	49.00	4	47.55	5	47.84	3.4	17	50.49	2.8
9	3	50.80	5	49.70	8	50.11	2.4	27	52.00	2.1
10	2	50.60	6	54.00	8	53.15	2.0	22	54.84	2.1
11	6	54.45	1	56.50	7	54.74	1.3	23	56.05	3.0
12	7	54.78	5	55.24	12	54.97	2.8	19	59.03	2.1
13	2	53.00	7	56.84	9	55.99	3.0	27	60.84	1.9
14	13	60.28	4	58.52	17	59.87	2.3	20	63.02	3.0
15	7	61.15	2	60.75	9	61.06	3.7	28	63.43	2.1
16	11	61.06	3	57.36	14	60.33	2.5	20	64.34	2.0
17	12	61.58	2	59.00	14	61.21	2.0	10	64.05	1.8
18	6	62.91	5	62.18	11	62.58	2.2	4	65.70	.5
19	5	61.94	1	62.10	6	61.96	1.8	2	65.40	3.1
20	10	62.52	3	56.17	13	61.05	3.0			
21	3	60.30	1	61.60	4	60.62	3.0			
22	2	60.95	0		2	60.95	2.3			
	90		49		139			245		

clearly understood that conclusions other than the most general based upon these data are not wise.

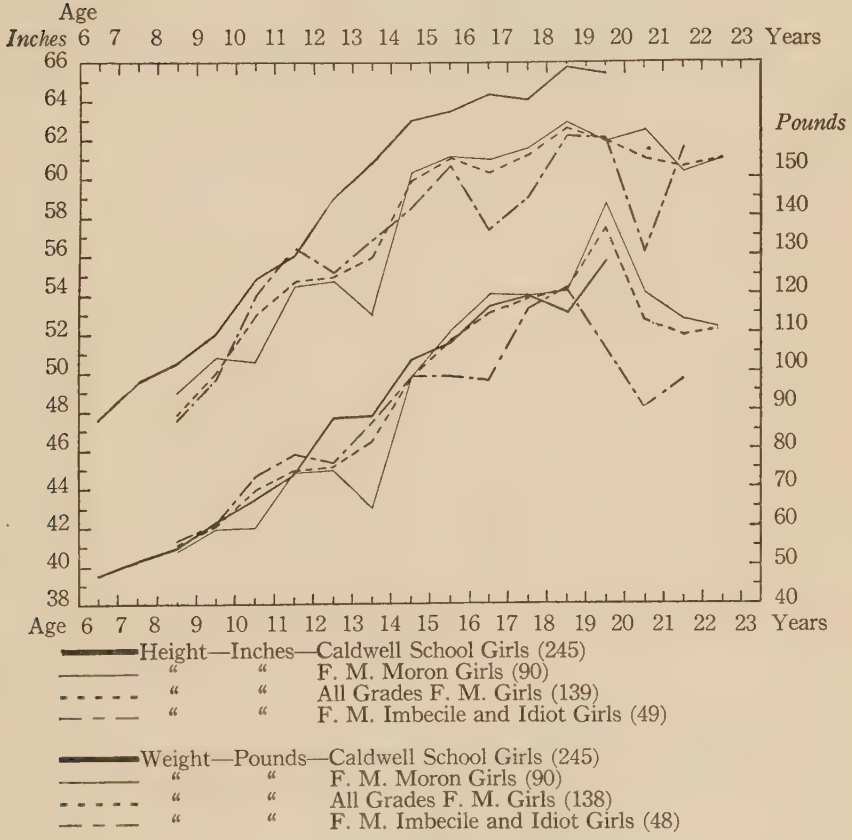
The record of girls is pictured in Graph III. The curves for height are more irregular than those of the boys. From this study mentally defective girls as a group are on the average from two to five inches shorter than normal school girls. This is about the same as with boys. It will be noted that there is a larger difference between the defective girls of this study and Goddard's 3,300 institution girls in regard to height than difference between boys (Graph I). In this study the two groups of higher and lower grades

[8] A greater number of cases would probably "smooth out" the exceptions at the two latter ages.

are about the same in number with boys, but with girls there are nearly twice the number of the higher grade.

In weight it is very noticeable that the girls of the two large groups, normal and defective, up to nineteen years deviate less than do the boys. Weight would no doubt be subject to modification by regular habits of eating and sleep-

GRAPH IV—GIRLS



ing much more than the individual's natural tendency to stature. These girls of institution care show the good effects of such regularity when it comes to bodily weight.

Graph IV shows the defective girls divided into the higher and lower grades of mental defect. These curves are very unsatisfactory, showing much irregularity. This condition may be due to one or several causes. First, the classing of

the defective children into grades is chiefly empirical, an inter-changing of one or two cases might modify the lines; second, it is to be regretted that the number of girls tested is much smaller than that of boys; third, there may be exceptional cases as number 123 at age 20 (Table II). The most peculiar feature of the lines as they are is the crossing at age fourteen. From Graph II, high and low grade defective boys are distinctly apart at each age in height and weight. But with girls the curves cross at 14. Before this time (excepting 8 and 9 years in height) the lower grade girls are taller and heavier than the brighter girls; after

TABLE IV

GIRLS' WEIGHT—POUNDS. (ORDINARY CLOTHING)

	Grades A and B Moron		Grades C, D and E Imbecile and Idiot		Total Defectives			Normal		
Age	Cases	Average	Cases	Average	Cases	Average	A. D.	Cases	Average	A. D.
6								9	47.94	5.5
7								17	51.29	6.1
8	1	52.00	4	56.75	5	55.80	9.0	17	54.38	6.5
9	3	59.66	5	61.00	8	60.50	7.2	27	61.48	6.9
10	2	60.00	5	73.20	7	69.43	6.7	22	67.14	7.4
11	6	74.00	1	79.00	7	74.71	10.8	23	73.88	13.2
12	7	74.71	6	76.83	13	75.69	8.9	19	88.41	12.7
13	2	65.00	6	87.66	8	82.00	13.7	27	88.44	9.4
14	13	99.00	4	99.00	17	99.00	13.0	20	103.13	12.3
15	7	110.71	2	99.00	9	108.11	17.0	28	107.87	11.2
16	11	120.09	3	98.00	14	115.35	17.6	20	117.00	11.5
17	12	119.50	2	116.50	14	119.07	12.6	10	119.67	10.8
18	6	121.18	5	121.80	11	121.45	12.8	4	115.27	8.8
19	5	143.20	1	106.00	6	137.00	24.0	2	128.65	8.2
20	10	120.00	3	90.66	13	113.23	18.5			
21	3	113.66	1	98.00	4	109.75	11.2			
22	2	111.00	0		2	111.00	3.0			
	90		48		138			245		

age 14, the reverse is true. Can it be that high and low grade defective girls at about the fourteenth year reverse themselves in body growth? Again let it be understood that the condition is probably due to too few or exceptional cases.

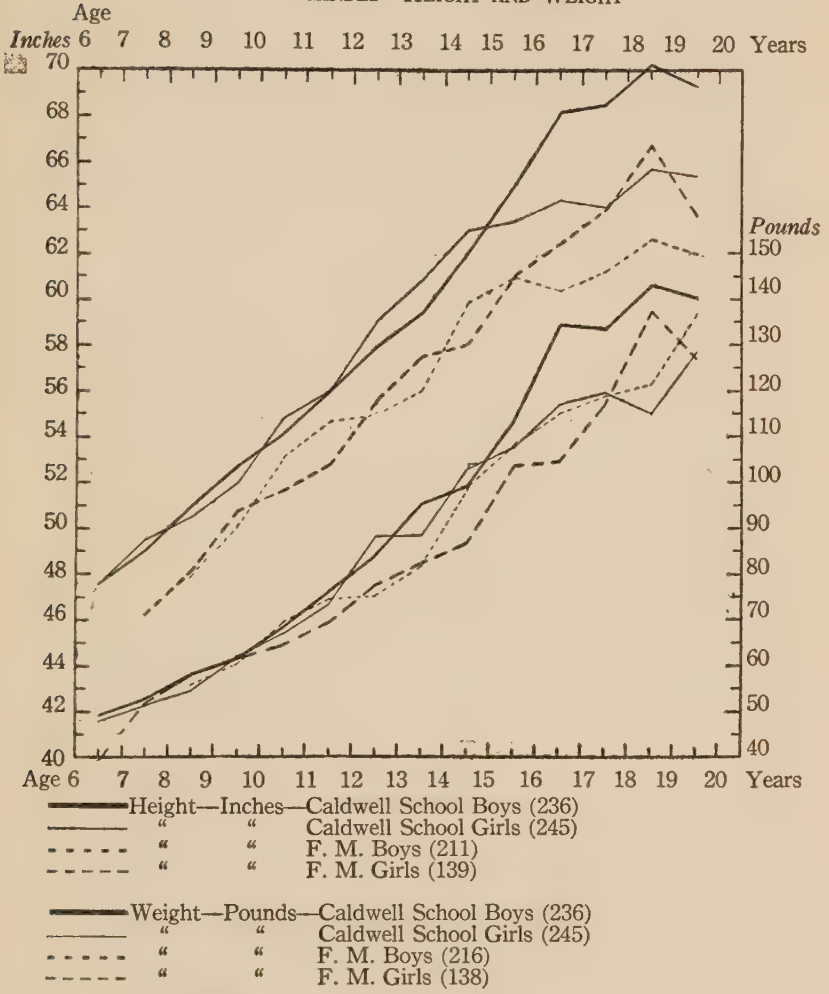
SEX DIFFERENCES

Various studies with large groups of normal children have shown that from about eleven to fifteen years of age the girls were larger than boys in both height and weight. (For example, Smedley (11, p. 1100); or MacDonald (6, p. 1023.)

In order to see whether or not this condition reflected itself in measurements of mentally defective children, Graph

V was made to show the records of both groups in both traits superimposed. The heavy and light continuous lines in the upper group represent the height of the Caldwell school boys

GRAPH V—COMPARISON OF SEXES—NORMAL AND FEEBLE-MINDED—HEIGHT AND WEIGHT



and girls respectively. The broken dash and broken dot lines represent the height of feeble-minded boys and girls. The same comparisons are true in the lower group of lines as to weight. Excepting ages twelve and thirteen with

defectives, in which there is an abnormal rise with boys and drop with girls, normal and feeble-minded girls are taller than normal and feeble-minded boys from ages ten to fifteen. In weight there is the same general condition. Excepting age thirteen with normals at which both curves are irregular, the Caldwell girls weigh more than the Caldwell boys from about beginning twelve to beginning fifteen years. Noting exceptions at the twelfth and thirteenth years in the lines for defectives, feeble-minded girls are heavier than feeble-minded boys from ten to seventeen years. Sex differences as to height and weight in normal children through adolescence is approximately the same with mental defectives.

TABLE V

PER CENT OF DEFECTIVES REACHING OR EXCEEDING AVERAGE CALDWELL NORMAL CHILDREN

Age	Boys' Height			Boys' Weight			Girls' Height			Girls' Weight		
	Cases	No.	Per cent	Cases	No.	Per cent	Cases	No.	Per cent	Cases	No.	Per cent
6	1	0	0.0	1	0	0.0						
7	8	1	12.5	8	5	62.5						
8	14	1	7.1	13	5	38.5	5	2	40	5	2	40
9	14	5	35.7	14	7	50.0	8	3	37.5	8	4	50
10	18	2	11.1	21	6	28.6	8	3	37.5	7	3	42.9
11	22	3	13.6	22	4	18.2	7	2	28.6	7	4	57.1
12	18	5	27.8	19	7	36.8	12	1	8.3	13	3	23.1
13	17	7	41.2	16	3	18.7	9	1	11.1	8	3	37.5
14	25	6	24	26	7	26.9	17	3	17.6	17	6	35.3
15	23	7	30.4	22	6	27.3	9	3	33.3	9	4	44.4
16	17	3	17.6	18	2	11.1	14	2	14.3	14	4	28.6
17	10	1	10.0	11	5	45.4	14	3	21.4	14	5	35.7
18	7	0	0.0	6	1	16.6	11	2	18.2	11	7	63.6
19	9	1	11.1	9	3	33.3	6	0	0.0	6	4	66.6
Total	203	42	20.7	206	61	29.6	120	25	20.8	119	49	41.2

VARIABILITY

As far as is known to the author only one other study has calculated the age variability in height and weight of mentally defective children. Wylie (16) in a study of about four hundred children of each sex, from one to thirty years of age, found the mean variation to be greater with defectives than with normals.[9] Referring to Tables I to IV, one can

[9] He says, p. 6: "For height the curve of mean variation exceeds that of normal children except in two or three instances. In general the mean variation is greatest at times of fastest growth, but there are many marked exceptions to the rule. . . . The curve of mean variation for weight shows the same general features as that of height except that it is nearer normal up to ten years."

compare the variability at age of the two classes of children in this study. Excepting ages 8, 9, and 10, defective boys are more variable than normal boys in height. In weight, up to about age thirteen, defective boys are more constant; after thirteen they are more variable than normal boys.

From eight to nineteen inclusive, defective girls vary more than normal girls in height if we except ages 10, 11, 14, and 19. In weight, after the thirteenth year, defective girls vary more than normal girls at age. Very probably a greater number of cases, if distributed over the grades of defect, would show defective children more variable in height and weight than normal children, excepting possibly weight in the earlier years, if defective children had the regular care of institution life.

Per Cent of Defectives Reaching or Exceeding Average Caldwell Normal.

This is shown in Table V for each age. To interpret, take age seven for example: Of eight mentally defective boys, one or 12.5 per cent reached or exceeded the average height of Caldwell boys at the same age. Or taking the total: of 203 mentally defective boys from six to nineteen years of age inclusive, forty-two or 20.7 per cent reached or exceeded in height the average Caldwell boy at age. This is significant and means approximately that only one defective boy or girl in five reaches the average height for his age of a normal boy or girl. In weight boys make nearly a thirty per cent showing, while girls almost reach the average. Norsworthy (7) found these per cents to be considerably higher. She very probably had on the whole a higher grade of defective children.

Conclusion

It seems a safe conclusion from the above data that not only is mental defect reflected on the average in the height and weight of children, but the more decided the defect the more checked the physical growth. (From Graph IV there may be an exception with girls before fourteen years.)

This is more evident in height than weight, the first being probably less subject to modification by regular habits of sleep, diet, etc., than the latter.

Feeble-minded girls more nearly approximate normal girls in weight than do feeble-minded boys approximate normal boys.

The commonly known fact that girls are taller and heavier

than boys during early adolescence shows itself also with mental defectives.

Defective boys and girls are more variable in height than normal boys and girls. Before thirteen years, defective boys and girls of institution life are more constant in weight than normal boys and girls.

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THE PSYCHOLOGY OF THE BOY SCOUT MOVEMENT

By M. Jane Reaney, B. Sc.

The Boy Scout—the very name calls up a vivid picture,—a romantic little figure,—bare knees, slouch hat, pole, belt filled with numberless mysterious implements—and to those of us who have some inner knowledge of the movement it is not the externals alone that appeal. We have had experience of the chivalry, the resourcefulness, the self-control of the Boy whose motto is "Be prepared."

Six years ago Sir Robert Baden Powell started the movement—to-day it is world-wide. The Boy Scout is a familiar and popular figure in every land, and many of the leaders of the present time do not hesitate to consider the Boy Scout movement as the most far-reaching and significant movement of modern times. What is the reason of this? What is there in the Scout that has appealed so tremendously to the boyhood of the world?—that has changed so many of the hooligans of our cities into well-ordered useful members of society?

The answers to these questions are not far to seek. By some almost incomprehensible stroke of genius the originator of the movement has shown such a profound, though it may be unconscious, knowledge of psychology of the boy mind that he has devised a scheme that appeals to it in every sense. It has caught hold of the romantic adventure-loving soul of the eternal child—the soul that is the same in all times and nations and has given it that which it misses in the rush and stress of our over-civilized life.

It is not the purpose of this article to discuss the details of the Boy Scout movement or the splendid results which are universally known. Rather we must try to analyse the reasons for its remarkable success especially amongst children of the lower classes to whom games, as such, do not appeal so strongly.

The Study of Child Psychology has made great strides in recent years, but the science is still only in its infancy. We have, however, already come to the conclusion that the child must not be regarded as the immature man, and that his mind is of a more primitive type, and probably in its development follows the stages through which the race has passed.

Again we are losing the old idea that man, as an intelligent being, has few instincts, and the theory is gaining ground that he possesses a very large number of instincts, but that these are modified by intelligence to such an extent that it is difficult to recognize them in the adult. Mr. MacDougall, in his book on Social Psychology, suggests "that directly or indirectly the instincts are the prime movers of all human activity. . . . The instinctive impulses determine the ends of all activities and supply the driving power by which all mental activities are sustained." Again we are beginning to realize that these instincts appear at different stages of development and that if they are stunted or perverted great injury may result to the individual. Freud and his followers have proved in connection with their work on psychoanalysis that much of the neurotic tendencies of adult life can be traced to the suppression of instinctive desires in childhood.

The period of infancy and immaturity lengthens as we come up the animal scale, and it is during this period that the play activity develops so strongly. Karl Groos, in his classic work on the Play of Man, suggests "that the very significance of youth is due in part to the necessity of play: the animal does not play because he is young, he has a period of youth because he must play." It is by play that the developing instincts are given scope and means of expression and it is only by watching carefully the way in which children play that we realize the times and ages at which the principal instincts appear. For in play a child is unconscious. Free and untrammeled by the masterful will of the adult he expresses himself without fear.

It is often pathetic to see how a child realizes that the grown-up fails utterly to understand his point of view. For the mind of the child is much nearer the mind of the savage than that of the civilized adult, but few there are of us who have sufficiently vivid memories of our childhood to realize this. His ways of looking at things differ widely from ours—his ideals are simpler—his logic more relentless.

Many observers of children's play have noticed that certain types of games appeal to children at different ages. We can roughly divide the play periods into three distinct groups:

(1) The age of dramatic play.
(2) The age of rivalry and self-assertive play.
(3) The age of loyalty and co-operative play.

These periods naturally have no abrupt division and tend gradually to merge into each other, but at the age of nine or ten the marked tendency towards dramatic play is displaced by a strong sense of rivalry and self-assertiveness. The boy

is no longer satisfied with make believe. He becomes critical, he wants to do—to make things. He wants to fight for the sake of fighting. It is at this age that we hear so often the expression "I can do this better than you." There is a keen desire to beat others and the games that foster this, together with those that make use of the hunting and fighting instincts are most popular. Romance looms large in the form of love of adventure. This is the stage when the boy plays truant, and when the stronger spirits run away to sea.

We are only just beginning to realize that the child is but fulfilling his destiny, he is going through the stages of the race. To him the simple qualities such as strength, prowess, bravery, appeal. His mind cannot appreciate the passive virtues and the adult who attempts to instill them is often regarded with pity or contempt. He is one with the savage 'brave' and the things which appealed to our remote ancestors appeal to him. Now is the time, if his instincts are not thwarted, to cultivate these stalwart primitive traits and make them his servants for future life. The boy at this stage is a 'cub' and in many cases a disagreeable cub, because we do not know how to deal with his 'cubbishness.' It is but Nature asserting herself when the child of gentle nurture prefers to play at 'slaughter house' rather than the kindergarten game involving raindrops and flowers.

During this period of growth there is a marked want of co-operation. The child needs a leader for all games which involve working together with others. Team games do not appeal to him, as such, and even if he is taught to play these, individualism remains the most dominant feature.

But at the dawn of adolescence a change in his outlook appears. The boy fails to understand himself. Romance appeals to him even more than previously, but it is the romance of high adventure and fine achievement. He must have a hero to worship. The spirit of co-operation arises. The old individualistic fighting games are not enough for him. At this stage group games such as football and hockey become most popular. Gangs and clubs are formed. The feeling of group consciousness arises. The idea of self-suppression, of working, as part of a greater whole, has a strong appeal which shows itself, not only in the magnificent co-operation of a football team, but in the loyalty to the leader of a hooligan gang. For the gang is but a perverted expression of the desire for co-operation: it is the primitive social group. In the boy of more fortunate surroundings this point shows itself in the love of the game, and the Games Captain often becomes a hero to worship and copy.

But in the classes where the fight for life is more strenuous the game, as such, does not appeal so strongly; it is not sufficiently utilitarian. It does not obviously prepare for after life. It is to the child of this class, at this stage, that the Boy Scout movement has come as a godsend. He stands at the threshold of life full of unfulfilled desires. He longs for romantic adventures but his life is sordid. He loves doing—he must be ever occupied, his hands ache to make 'Things.' He wants a hero on whom he can set his budding affections—a hero whose character he can understand and copy. The passive virtues required in school and office are not for him—his hunting and fighting instincts are too powerful—he would like to be sailor or soldier. His gregarious instinct is coming to the surface, he wants to be a unit, amongst other units of a great barbaric whole. In fact, the crude spirit of primitive man is working in him. He wants to be a cause, he must make himself felt. And he does, but often in ways which we deplore. But he becomes a Scout and all these seething desires seem satisfied, his fierce longings are quelled. Romance comes to meet him. He lives in camp the life of his favorite pioneer on the outskirts of civilization. He does interesting things—he learns to make common useful things in a romantic way—a hero is set before him who has the virtues he can understand—he is one of a group all working towards an end, at the same time his individuality is not suppressed,—his desire for rivalry is satisfied—he now aims at making his patrol, his company, the best. His crude love of dressing up, his fondness for pomp, ceremony, display, all find their place. He can grasp and understand the simple doctrine of the Scout Law. His innate love of being ruled by one stronger than himself, his real love of implicit obedience—a desire which is latent in every child—finds scope, his sense of respect for office,—a sense often killed by our modern tendencies,—is fostered and makes the groundwork of his respect for law and order. He is making, doing, living a life of chivalry and adventure. He is filled with passionate loyalty to a cause. He is in all thoroughly interested. The scheme fits in so absolutely with his constructive demands. And above all and through it all runs the feeling at the back of his mind that he is free—he is not being coerced to do these things, he is doing them of his own free will: in other words he is playing a splendid game.

Therein lies, I believe, the secret of the success of the Boy Scout Movement. It satisfies an instinctive need, and therefore it appeals to the interests of the universal boy mind. And in appealing to these interests it takes hold in a way that

the ordinary school education cannot, or at least does not. It appeals to him and interests him because it shows him ways and means suited to his stage of development. He understands why he learns to cook with few implements—to splice ropes—to do mechanics in order to understand the mechanism of a bicycle, arithmetic in order to be able to work out a scheme for billeting a company. He is implicitly obedient to the Scout leader, not because he must be, but because he knows the whole spirit of the cause would be lost if he were not. He suffers hardship—he gives up his place to another—he does a subordinate job without grumbling, because he realizes he is but part of a concrete interesting whole, and the success of this whole means much more to him than his own. The spirit of the Game pervades him, but it is a game the use and value of which he realizes—a game which enables him to approach more and more to the standard of his ideal. Therein, I believe, lies the secret of the Boy Scout Movement. It is a splendid Game that satisfies entirely the needs of the boy at this stage of his development. And herein lies the secret of its great achievement. Having got the boy, body and soul, by an appeal to the things he can understand, it makes use of his interest, his loyalty, his suggestibility—to inculcate the more subtle virtues of purity, justice, honor and uprightness which go towards that which is the goal of all education—the making of a good citizen and a good man.

NOTES ON THE TALK OF A TWO-AND-A-HALF YEAR OLD BOY

By Alice D. Snyder, Vassar College

(I was living with the child most of the time from the middle of June, when he was two years and five months old, until the middle of September. Very frequently throughout the summer I would take down as accurately as possible everything that he said during a continuous conversation. Moreover I was always on the lookout for data on certain interesting questions, and noted down such data whether the significant remarks were made during an observation period or not. Of course the notes from which I have generalized embody only a very small fraction of the summer's talk. The observation periods, though frequent, were not regular. My notes are by no means conclusive, even as regards this one child, simply suggestive.)

Analysis of Sentence Types

As was to be expected, a large proportion of sentences were imperative. These were easily accounted for.—Problem: to analyze and define other types in their relation to the imperative. (Exclamations here ignored, as not co-ordinate with more fully differentiated types.) Hence problem resolves itself into—

Relation of questions and declarations to the imperative.

(Definition of two fundamental sentence types: *Imperative,*—any sentence that is a direct means to an end, that calls for an action-response. *Declarative,*—any sentence that is used to express, define, that is to a degree complete in itself, whose value does not depend primarily upon a response.)

I. *Questions.*

Simplest questions ordinarily recognised by psychologists as questions are those involving such interrogative words as "What" and "Why." These naturally a rather late development, far removed from the child's early imperatives, for they indicate an interest in the "relation of images"[1] and, according to Sully (whose "simplest form of question" is of the type, "What is this insect?"), they are the "outcome of ignorance, coupled with a belief in the boundless knowledge

[1] *Cf.* King, The Psychology of the Child.

of grown up people." They show "that the child, by a half conscious process of reflection and reasoning, has found his way to the truth that things have their qualities, their belongings, their names." [2]

Such questions are the counterpart of declarations rather than of imperatives, for they indicate an interest in facts as facts. Moreover, they are much less simple than declarations, even. According to Sully they seem to be a somewhat blind groping after knowledge, after no one thing or name that is definitely suggested, but after almost anything that will connect itself with the new experience; they are not the expression of some image that is definitely suggested by the experience. The only positive motive seems to be the very general notion that things have their names, etc., the image a very abstract one.

I was interested in noting many earlier sentences that evinced apparently simpler mental processes and yet were to all intents and purposes questions. Various classes of these:

A (frequent). Simple variations of the imperative—the means to some end in which the child took an active interest —requests, though uttered with a real question intonation.

Ex.—More play ball?
Want play ball?
Like go out dat boat?

The child was working for the accomplishment of his own ends as truly as when he was using the form of command. He was suggesting that you should like to go out in the boat much more than he was asking in a disinterested way for information about your preferences. Yet in a sense these seemed to be real questions, for the imperative proper meant to the child immediate, or relatively immediate, control of a situation.

The request showed the recognition of an intermediate factor,—the disposition of the second person involved. This demands a different sort of control—hence the pleading tone; moreover, in the case of the request an element of uncertainty comes into consciousness; there is a need for information;—*knowledge,* the demand is for a verbal rather than an active response. Hence the hesitation, the rising inflection, etc.

B. Requests for permission, rather than for active coöperation. These again in the form of questions about another's likes. Again, a pretty direct means to an end.

C. Requests for approbation as well as for permission, as when he said, "Want blind shut?" "Want flag down?" He

[2] Studies in Childhood.

was trying to assure himself of the spectator's approval, to realize a suggestion which, if realized, strongly reinforced his original interest in the act. A favorable response meant not simply the removal of a possible check to action, but added delight through sympathy with another's enjoyment. Indeed, the act for which the child asked approbation was sometimes first suggested by a sympathetic interest in what some one else was doing, as, for instance, when he would ask, "Want me help you up steps?"

In all three classes noted the question request was intimately connected with some overt act of the child's. This was almost always the case. Only occasionally would he ask about another's likes when they had no connection with any act of his own.

D. Questions of fact, etc.—questions that were not mere variations of the imperative, but rather the counterpart of the declaration.

1. Class represented by such questions—half question, half exclamation, as, "Big noise?" "Big joke?"

Here the child's interest was to some extent in facts, names, in images abstracted from the activity, not so much in what he could do with the thing as in what he could say about it.[3] Or, to be more exact, what he wanted to *do* to the thing was to have it named. But even these questions were far simpler than the child's "What"s and "Why"s. Here again the child was by no means asking in a disinterested way for the name of the thing nor even asking whether it was a "big joke" or not. He was rather suggesting that it should be called a "big joke." The phrase was suggested to him by association; the situation was incomplete without it; hence he would try it, hoping for corroboration. He wished to hear someone say "Big joke." No more than in the imperative question request, was the question here an unguided feeling out after knowledge; it was a tentative statement of a suggestion that he wanted to realize.

That all such questions, whether of fact or of volition, were tentative statements or suggestions rather than unguided speculation, is confirmed by the child's manner of replying to questions. At least, this hypothesis would account for a manner of responding which might otherwise be difficult to explain. In common with various children whose records I have been reading, this child would hardly ever say "yes." Sometimes he would use "do" as an affirmative response;

[3] *Cf.* King.

more often he would answer "No," as a purely arbitrary means of getting rid of an obnoxious questioner. I have not seen any explanation of this habit; but if the questions of others meant to the child the sort of positive suggestion that his own questions evidently meant, it is easy to see why he should form the habit of saying "Do" and "No" before he learned to say "Yes." For the only questions asked the child that really demanded an affirmative response were questions as to what he wanted to do or have, questions to which he naturally replied by repeating the "Do" from the "Do you?" of the question. If the question did not regard his wants it called for no reply unless it were negative. For if asked whether something he was eating was good, the question did not imply a doubt that he must allay, it simply suggested that the thing was good, and that he knew already. What was there to do or say about it? When the response called for would be negative, the matter was very different; then there was a sharp contradiction between the thing suggested and the real state of affairs, and the child had to reconcile the two by negating the affirmative suggestion of the question. (Possibly the fact that "yes" is a difficult word is a sufficient explanation.)

2. Finally toward the end of the summer appeared the questions which are universally recognised as such, questions involving interrogative words, and these offered a different problem. (Even these questions, "What doing?" "What dat?" seemed simpler than what Sully cites as the simplest form—"What is this insect? These asked only for names, Sully's for definition of something already named.) In the questions "What dat?" etc., there was no concrete word image suggested which the child was using tentatively. It was natural enough that he should think of a small black thing as a fly and want to have his nomenclature confirmed; it was a very different thing to think of it as a "What." Here the image which prompted the question was not some definite word which had been previously experienced as part of a similar situation; but a vague "what" belonging to things and acts in general, to nothing in particular. Yet I found myself wondering whether these questions were so essentially different from the earlier ones that they alone had the right to the name,—whether the "what" sense, the abstract sense of things as things with qualities and names—whether curiosity, or a blind reaching out after knowledge, *any* knowledge which would satisfy this vague sense, was strong enough

at this age to account for the ceaseless repetition of "What dat?" and "What doing?" It seemed as though the speculative interest must always have been pretty strongly reinforced by something in the particular situation which called for this response. As a matter of fact, I think these questions were demands rather than disinterested inquiries, and demands for recognition rather than for knowledge. Such questions were frequently asked when the child was watching another person do some piece of work which prevented his giving to the child the the attention he considered his due. Unoccupied himself, watching an act in which he had no part, he was restless. He *would* have some part in the proceeding, he *would* be taken into partnership, so to speak. If he could not assist, he could at least draw the worker into conversation. His real motive was the general but insistent one of demand for recognition. A relatively faint speculative interest in the "whats" and "wherefores" of things offered the particular channel for gaining this recognition.

II. *Declarations.*

A. Many, while declarative in form, were in function mere variations of the imperative—like the question requests.

"Might do ———"
"Want do ———"

B. Many, however, were declarative in function as well as in form. Two classes,—Personal, and Impersonal.

1. The personal declarations of fact,—declarations of which the subject, expressed or implied, was often "I." These contained *many real verbs, action verbs.* The statement usually preceded the act and in form suggested futurity. The ordinary formula was not "I do——" but "I go do——" as

"I go get down."
"I go throw in water."

In a way such statements served as requests for permission and as bids for the approbation of the onlooker; but more than this they served to define, to objectify, the child's acts for himself. He was, by the very process of naming, to some extent making of the act an end to be accomplished. Interest was centered to some extent in the end rather than in the activity itself.

2. Impersonal declarations of fact. These, on the other hand, *contained very few real action verbs.* Verb was usually "is" (understood), "has," or "got." Was simply naming thing or its attributes. The real action verbs that some-

times appeared were frequently called forth by some especially startling or interesting occurrence:

"Whip fall."
"Hair come down."
"Big cow scratch ear foot."
"Rain come all through roof."

The commonest sentences of this type, however, were of the form,

"Dat tree dere."
"Dat water dere."
"Dat nice water."
or, "Fly dere."
"Fly on dat big stone."
or, subject omitted, "All dark."
"All gone now."
"Big stone."

These evinced a real interest in naming things,—situation was incomplete without a name.

Definitions

During the summer the child had not reached the stage of asking for "definitions" of objects—simply for names and occasionally causes. Presumably he would not have given "definitions" if asked what things were. But a few months later (age—two years and eleven months) he was willing to reply to such questions as "What is a clock?"

These definitions took the form,—"So do ———." The child went straight to the point, to the particularizing element of the definition; there was no room for any concept such as "a thing" followed by "which." While the definitions gave the habitual activity or employment of a thing, they often failed to give its real use as recognised by adults. A towel was "So get hands dry," but an apron was merely "So keep it on." The definition which revealed in the most delightful way the real significance the object had for the child was that of a cat. A cat was—"So keep tail on."

(Prevalence of utilitarian ideas in children's definitions noted by Binet, Chamberlain, etc.)

Figures

Very little material on metaphors and similes. Metaphors more common than similes. Applied, as a matter of course, the term "big cow" to anything at all frightful (had once been frightened by a cow). At the same time he was using

the epithet in its literal sense. Would call any small black thing a fly.

Occasionally used "like." Once said "Dat stone like big cow." The other occasions on which he differentiated to the degree implied by the *simile* were in cases where he himself was one of the elements being discriminated—"I go fast just like auto," etc. *Seemed* more apt to use simile form "like" with acts than with things, but not enough data to judge.

The only times he seemed to take pleasure in the figurative element, to be conscious of it, in fact, were in cases where he had been taught to make-believe, to play some game.

It was noticeable that when *pretending* entered a sphere that concerned him too closely, when it involved the integrity of his personality, he would immediately work the case out into literal, fact form. For instance, he would make sand houses with me, happily agreeing that a hole was a window, a stick a chimney, etc. But when I took a stone and said, "That is H—— [his name], going in the door," he immediately demurred—"Dat not H——!" Several months later when I was trying to persuade him to take a nap, I unfortunately said, "Now H—— is sound asleep." He not only denied the assertion, but really argued the case (a thing he was not in the habit of doing). He called attention to the fact that his eyes were open, and then got up, walked around the room, and announced "I'm walking."

The Child's Use of the Negative

1. Position of the negative word. (Sully and Major note that the child frequently forms negatives by placing "no" at the beginning or end of an affirmative sentence.) This child at the beginning of the summer said—"Touch it no" and "Shoe all gone no." But he soon learned to use "not," "don't" and "won't" quite normally.

2. Many negative imperatives and statements of his likes—or dislikes. These were of course called forth by positive suggestions (in words or acts) that concerned him nearly and had to be negated. Ex.—"Don't go near that chair." "Don't want ———."

3. Negative statements of fact (objective). These were ordinarily startled out of the child by a sudden interruption of the familiar, by the failure of the expected to happen. The child had not learned to reason about these phenomena, at least not to ask the why's and wherefore's. He simply called attention to them; as a matter of fact, this was sufficient. The difficulty, if difficulty it were, was ordinarily immediately remedied for him.

4. As already noted, negative responses were frequently used in a purely arbitrary way. If asked whether he could say "Uncle Harry" the child would, as likely as not, reply, "No, I can't say 'Uncle Harry.'"

5. *A peculiar use of the negative, apparently typical of children of this age—the use of antithetic statements.* This was noted by various psychologists.[4] Explanations offered: serves to bring out meaning; gives practise in the rudiments of reason; indicates independent observation; shows a delight in fickleness.

I recorded a number of instances:

Not go out dat boat; go out big boat.
Not dat boat hot; dat boat hot.
Dat not pretty tight; dat pretty tight.
Not put pipe in mouth; Brother L—— put pipe in mouth.
Not go too far out; Dadda and Mother go too far out.

a. Instances which were closely related to the child's immediate interests—in which there was a definite end in view, hence a definite right and wrong, one suggestion which would not satisfy and must be negated, another which would satisfy, a positive in which he could rest. These were more than "independent observation" and were possibly more than "practise in the rudiments of reason." They were of more immediate significance than would seem to be indicated.

(1.) The negative may sometimes have been an actual stage in defining the positive for himself rather than a method of bringing out a meaning already defined. For instance, when the child said, "Not go out dat boat; go out big boat," it is quite conceivable that he settled first upon the wrong boat by chance, and that he was forced to reason, to distinguish, until he found the right boat, the one in which he might go out. The negative may have been a real step toward the positive. In such sentences as "Not go too far out," "Not put pipe in mouth," the negative was clearly suggested by the prohibition of some act which he was interested in performing. Here again the child went on to discover a positive in which he could rest; but here he gave up trying to find the particular thing he might *do*, and simply philosophized about the matter, distinguishing between himself and other people until he found a positive *statement* which was satisfactory.

(2.) Sometimes the negative followed the affirmative instead of preceding it. Here the use seemed somewhat more arbitrary. For instance, when he would say, correctly enough,

[4] *Cf.* Preyer; Dearborn, Motor-Sensory Development; Sully, Studies in Childhood; Miss Hogan, Study of a Child; Tanner, The Child.

"Dat boat," and then add "not dat boat way over dere," the negative seemed more like an after-thought than like a stage in the child's own particularizing process, though it certainly served to "bring out his meaning." I fancy the child sometimes rather deliberately suggested the wrong boat for the sake of enhancing the delights of conceiving the right one. The pleasure doubtless consisted largely in the closer definition involved, and in so far was rational. But I think there was another element—that the boy shared to some extent the feeling of the naughty boy who wants to see how near he can come to doing the forbidden thing without quite doing it. To suggest the wrong boat and then the right one gave him more than a sense of delightfully definite perception; it gave a sense of power, of control, that he enjoyed using somewhat arbitrarily.

b. More arbitrary cases, in which there was no definite end, no right and wrong. The child would say, touching one boat and then another, "Dat boat hot; not dat boat hot," or, dipping his toy frog in the water and taking it out again, "He wet now; he dry now." Presumably he didn't care in the slightest whether the boat was hot or cold, whether the frog was wet or dry. These instances suggested more strongly the "independent observation" of Preyer, and the delight which Dearborn finds in the child's comparing brown bread and white bread.

They indicate something more than these, however. The child was observing even here in a perfectly rational way. He was not simply vacillating between any two perceptions that chanced, but he was definitely comparing with respect to some unifying element, such as temperature, which had at some time been of considerable significance. He was at least getting practise in the rudiments of reason. Moreover I think that in such cases he was not simply reasoning but to some degree consciously creating. In the case of the frog the child was actually making it, now wet and now dry. When he said, "Dat boat hot; not dat boat hot," he did not first feel of the boats and then comment on them, but when he said "dat boat hot," he would touch it, thus making his finger feel hot, and then again cold. It may be of significance that he so often distinguished between "this" and "that," or rather between two "that"s, indicating first one and then the other, for here by gesture and other means he was very *actively* identifying himself first with one and then with the other. In as far as he was acting and not merely speculating, again, he was acting in a rational manner—not

in a hit or miss fashion. He was creating in accordance with some principle such as size, temperature or wetness.

The use of antithesis, then, even when it seemed to serve no immediate purpose, was in itself a constructive activity—more definitely constructive than is suggested by such epithets as "fickleness" and "independent observation"—and a little more of an activity than is suggested by saying that it gives "practise in the rudiments of reason" or serves to "bring out the child's meaning."

Progressive Definition of Perception

Many instances noted in which the child corrected a vague or incorrect sentence to make it more definite or exact. This habit of correction is noted by Preyer and others; I have never seen it commented upon except as proof that the child took no delight in deception.

1. The largest number of corrections I noted consisted in the addition of a modifier to a noun to make it more definite.

All gone tail—Pony tail all gone.
Bo—Sailboat on water.
Dat water—Dat dirty water.
I want lie on pillow—I want lie on this pillow.

2. Closely allied to these were cases in which the child corrected the modifier used. Certain phrases learned *in toto* were sometimes used quite mechanically. For instance, things the child talked about throwing away were ordinarily "old things," and it was a real effort for him to dissociate the adjective "old" from the object of the verb "throw away." Hence a case demanding correction:

Got throw dat ol—dat pretty box way.
I want throw dat ol—dat big stone way.

3. Sometimes the noun itself was changed to be more definite.

Might take paddle out boat—Might take paddle out canoe.

The most interesting case of such amendation was in the following series of sentences, fairly climatic in arrangement (noted down later from memory, but I think accurately). The child was almost talking to himself, evidently delighting in the successive stages of definition:

Train go on track.
Car go on track.
Wheel go on track.
Little wheel go on track.

4. Occasionally correction took form of insertion of adverb to define act more exactly.

Like bump?
Like bump very gently?

5. Sometimes he would supply in second version an element essential to a grammatically complete sentence—the subject or object of a verb, for instance:

Don't let way out—Don't let oar way out.
All gone—Frog all gone.

6. Finally the correction would take the form of adopting a normal sentence order.

Down sand beach I been—I been down sand beach.

Complex and Compound Sentences

(Comparatively little interest seems to have been taken in the development of complex and compound sentences—especially in the early forms where the conjuctions and relatives are not explicit.)

1. Relatives, etc.

In the course of the summer I noted a number of complex sentences involving relative clauses, though the relative was not always expressed.

Where and *What* were expressed.

Dat what make pony go.
I don't know where M. put dose.

Where and *What* were naturally much more significant words than *Which* and *That:* he was often asked where or what something was; moreover they were essential elements of his sentences—they served as substantives that had not been expressed.

The case of the pure relatives was different: There was no need of expressing them, for they represented a substantive that had already been expressed—indicated merely a change in function.

Hear big noise whip makes.
Might go in track auto made.

The words *track* and *noise* carried over into the relative clauses, and the fact that they were functioning in new ways was not of sufficient importance to the child (nor would it be to most adults) to call for a new word.

2. Cause and effect relations.

Before conjunctions were used to any extent the child was using what were in effect compound sentences—semicolon

sentences. When the relation between the two clauses was close enough to warrant their being called one sentence, it was most frequently that of cause and effect.

These sentences did not, however, evince any interest in the "concept of causality," any cold-blooded reasoning.

Usually the clause which might have been introduced by *because* was used to re-inforce a demand—was part of an imperative.

> Don't fall; might hurt you.
> Don't carry me; too heavy.
> Don't put arm around me; I all right.

The *because* clauses here were to some extent mechanical repetitions: This was not the case, though, in the following instances:

> Please get my spoon for me; I can't eat.
> Please carry me; grass wet.

And even here the explicit statement of the reason was part, not of an observation of fact, but of an urgent imperative.

Occasionally the cause and effect relation appeared in sentences which were declarative in form. In such cases, however, the inferences drawn stated not a simple fact but some act that must be performed.

> My hand cold; must put in pockets.
> He cold, got put on sweater.

When the cause and effect relation was first made explicit, it was by the use of the conjunctive adverb *so*. I have very little data on this subject, but it seems reasonable that *so* should appear before *because,* if, as Compayré says, children narrate in order of occurrence, since *so* looks forward.

It is noticeable that these instances in which cause and effect appeared as such—were dissociated—were instances where there was a real contrast between the actual condition suggested and the condition desired—where the act suggested by one clause very evidently did something, negated some actual or strongly suggested condition, such as coldness or inability to eat.

3. Compounding by means of *too* and *and*.

As a means of compounding *too* appeared slightly before *and*. In looking at a picture the child would say, not "lady and big man," but "lady big man *too*." He separated what he saw into two distinct perceptions, in which he lost sight of the unifying element; but, having expressed them as thus

[5] Later Infancy of the Child.

distinct, he would suddenly unite them again by the word *too*. The process he went through was very evident in one case, where he said:

"Pony lie down; big cow lie down; big cow lie down *too*."

The use of *and* did not show, of course, the same separation into distinct perceptions. The sense of sameness seemed to be present throughout and did not come as a surprise at the end. In fact the child seemed to delight in this sense of sameness. He would frequently repeat as much instead of as little of the sentence as possible.

"I have stand on water and have get out boat."

"I put foot up dere and climb over and put foot in dere and climb over."

"Mamma row and Dadda row and H—— row."

Presumably the child was almost incapable of further organisation—he had to utter clauses as wholes—could not easily hold off the verb until he had compounded the subject—but this does not alter the fact that his *and* sentences unlike the *too* sentences showed him to be fairly luxuriating in repetition, in sameness; he would sometimes utter them in a fairly sing-song fashion.

4. *Before* used occasionally.

HOW A KNOWLEDGE OF THE CHARACTERISTICS OF THE ADOLESCENT BOY MAY AID ONE IN DIRECTING HIS CONDUCT

By Mrs. Emma E. Kuno, University of California

A knowledge of the characteristics of the adolescent will enable the parent or teacher to see how he differs from the child on the one hand and from the adult on the other, and to regulate her treatment of him accordingly. It is a sad fact that more boys go wrong because of unwise handling than because of innate wickedness. The problem, therefore, that presents itself to every guardian of youth is not so much how to get along with a boy for the time being, as how to develop in him the ability to direct his own conduct; in short, to make of him the man that it is possible for him to be.

Because of the fact that adolescent intellectual and emotional changes are based upon physical change, it is difficult in some instances to determine whether given characteristics are physical, intellectual, or emotional. However, for the sake of convenience, I have classified them under these heads and shall take them up in order.

Physical Characteristics

The period of adolescence, from fourteen to twenty years of age, is one of rapid physical change and resultant instability. The different parts of the body grow at unequal rates and mature at different times, the organism being a unit in which each part seems to go its own way at its individual rate of speed.

1. *Fickleness of Appetite.*—A physical characteristic with which the parent rather than the teacher usually has to deal, unless it be in a boarding school, is fickleness of appetite. A child who has been trained from his infancy to eat what is set before him and whose mother has not made herself a slave to his fancies, is less likely than one who has been "spoiled" to be fastidious during adolescent years. Yet in some cases, even boys sternly trained become whimsical during adolescence. The characteristic usually appears at about the age of fourteen. It should be recognized as a physiological change that cannot be overcome by scolding or, during the

earlier years of adolescence, even by reasoning. One method of approach would be to first ascertain whether the food rejected disagreed with the boy, or whether his aversion to it was due to some hygienic tenet or religious belief. In such case, his feelings should be respected, and even though his guardian might not believe as he did, he should not be compelled to eat of the food. However, if it should prove to be merely a case of fickleness, although it would be best not to offer him the same kind of food for some time, yet it should appear on the table again within the course of a week or two, and if he did not then care to eat it, nothing should be substituted for it, but he should be left to make a meal of the things on the table. No special dishes should be prepared for him, and above all, he should not be "coaxed." While it is natural that the adolescent experience whims of appetite, the fixing of these whims may generally be charged to the indulgence of the parent.

I have in mind a case in which the mother continually catered to the appetite of her growing son. No matter what the menu might be she was always careful to find out what "Joe" would like and to prepare certain dishes for him. By this method his fickleness was not only fixed but greatly increased and it became difficult for even this painstaking mother to prepare anything to suit his taste. He grew to be an imperious and extremely selfish man, and if rumor is to be trusted, he is one of the most disagreeable and hardest persons imaginable to feed. Even when his wife tries her best to please him, he frequently pushes everything from him and leaves the house because there is nothing for him to eat.

I once knew a father, who instead of going ahead and serving each with whatever came next, made the dinner hour miserable by asking each of his children which particular cut of the roast or fowl he preferred and whether he cared for a little of this kind of vegetable, gravy, etc. At least one of these children grew up to be the kind of person one would not care to invite to dinner.

But, happily, I know of another instance in which this characteristic was dealt with in a way that I can heartily recommend. Two adolescent children, a girl and a boy, were entrusted upon the death of their mother, to the care of a maiden aunt. The first difficulty that arose in their new surroundings was because of their appetites. At first she tried to reason with them, but finding this of no avail and having ascertained that the food they refused agreed with them, she said nothing more, but was careful to see that each meal afforded a variety of wholesome food besides plenty

of bread and jam. These two stubborn young people ate bread and jam for nearly a week and often asked to be excused from the table after having eaten but very little. Finally, however, as no notice was taken of it, they began to eat other things, little by little. Gradually, the aunt was able to interest them in the physiological values of different foods and the benefits to be derived from variety. Their preferences were thus transferred to the intellectual realm, and now, three years later, they relish what is set before them and show no decided preference for jam. By her patience and tact, this aunt has done much both for the bodies and dispositions of these young people.

2. *An Abundance of Life and Vigor, and a Desire to Achieve, to Do, to Earn.*—This is a characteristic upon which the world depends for progress, and it should in no wise be suppressed. Unfortunately, however, it asserts itself during the early adolescent years just as the boy is beginning his high school course and makes him determined to leave school and get out into the world. An early adolescent is not amenable to reason on this point, and the argument that by leaving school when but half-educated he will compromise his future and never be able to fill a high place in the world, has little effect on him. He sees the opportunity for immediate gain and feels the fever in his blood.

The school, especially during the past decade, has done much toward solving this problem by the introduction of vocational studies which enable a boy to prepare himself along his chosen line and pursue culture subjects at the same time. A choice of subjects is offered him and thus many boys are held in school who would otherwise have drifted away. Sometimes a teacher is better fitted than a parent to discover a boy's particular bent and to lead him into lines in which he may find both profit and pleasure. He is thus held in school and at the same time given something that will further his life work.

The desire to take part in active life is sometimes satisfied by getting something for the boy to do after school which will bring him financial reward; or, if money is not his object, by either giving him some definite, constructive work to do at home, or by interesting him in an avocation which will satisfy his craving. A boy may thus be led on and kept in school until, as he nears the end of the high school course, he becomes willing to complete it of his own volition. The group influence helps to keep him in school during the last year, for he feels that it would be a disgrace to drop out and not graduate with his class. In a case which I have been observing, the

boy has thus been led along gently, term by term, until now, after having completed two years of high school work, instead of desiring to quit and apprentice himself to a saddler as was his intention, he has resolved to become an engineer. With this in view he has determined of his own free will not only to continue in the High School but to go on to the University.

If, after the completion of the High School course, a boy has no desire to go to College, I believe it is wrong to insist upon his going. A college education which is forced upon a boy who does not value it can do him little good, and his time might be better spent in active life.

Although it is often possible by the exercise of tact to hold boys in school until they have completed the High School course, the desire to achieve is too strong in others to be thus postponed. This is especially true in large cities where their associates are daily enlisting in the army of the world's workers. In a case of this kind it is perhaps best to permit a boy to leave school upon the completion of the Grammar School course, but both teachers and parents should endeavor to stimulate in him an ambition to continue some line of self-improvement. A boy thus guided may in the end prove a more intelligent citizen than one forced to continue in school when his heart is elsewhere. As adolescence is a time of change, it often happens that after a few years of business life, a boy reared in an atmosphere of culture voluntarily registers in college and resumes his studies with a relish.

In some boys, however, the desire to achieve must be stimulated instead of restrained, in which case the problem of the guardian is equally great. Work was given to man not for work's sake but for man's, and if we are to make a boy self-reliant and manly it is imperative that we furnish him with abundant opportunity for self-expression, and interest him in some definite line of work or athletics. No boy should be permitted to form the habit of idling away his leisure. The busy boy escapes many temptations.

3. *Sexual Desire.*—This is often strong in adolescent boys and in some there is little native power of control. There are many ways in which a teacher may help a boy along this line without his being conscious of it.

First, she should encourage athletics and other healthful exercise. This will to a great degree counteract the passion. She should also be careful not to keep him poring over his book long hours at a time, as sedentary life is conducive to its stimulation. In the assignment of home-work, she should take this into consideration and omit the non-essentials.

Second, she should be extremely careful in the selection of the literature and art which is put before her adolescent boys. Better, a thousand times, that our boys should grow up ignorant of the classic myths than that they be able to recite the details of all the vagaries of the gods and goddesses of Greece and have lost their manhood. Such stories may be taught with impunity to a younger child who does not comprehend their meaning, but a wise teacher in the High School will omit a great deal given in a modern text-book rather than run the risk of having adolescent minds dwelling upon that which is not pure. The same holds true with regard to pictures and works of art. Figures, such as formerly adorned our Sather gateway and such as the one that now stands in the center of our Museum of Anthropology here on the campus of the University of California, should be tabooed. The moral effect should always be considered before either the intellectual or the aesthetic.

Third, she should explain to her boys scientifically, and in a thoroughly impersonal way, the physiology of the body, and give them advice regarding its hygiene. Through her broad knowledge of sex as it exists in plants, in the lower animals, and in human beings, she will be able to make this subject infinitely more interesting than could the boy's older companions on the street. The teacher can bring before her boys the sacred function of sex and show them how dire are the consequences of its perversion. Having thus led up to the subject, it is not difficult to arouse in the average boy that sense of honor, that seed of ambition to be pure and manly, and that pride of race which will carry him through puberty to an untainted manhood.

Fourth, the wise teacher will not stop here but will do all in her power to keep temptation out of the way of the boys, realizing that while the spirit may be willing, the flesh is too often weak. She will warn them against the use of intoxicants, by which they would be robbed of their self-control, and against the dance, that curse of civilized society, which has perhaps done more than any other one thing to drag the boys and girls of our high schools and colleges into immorality. She will protest with voice and pen against this net ever being laid on the floor of her school-room for the feet of the young. Were our teachers fully informed on this subject, had they studied social pathology, visited rescue homes, learned the stories of the inmates, and kept themselves informed as to where many adolescent boys go after the dance, I believe that they would not lack the courage to lift up their voices against this evil, and I believe further

that we should soon have a dance in which partners would be held at a distance of at least two feet and the present evils obliterated.

Fifth and last, but not least, it should be the constant endeavor of the teacher to so fill the minds of her pupils with the good that there will be no room for the evil. Adolescence is the age of hero-worship, and now is the time that the biographies of the good and great can be utilized to the best advantage. Positive teaching must accompany the negative if the latter is to be effective. Otherwise, the house is but swept and garnished ready for the occupation of seven other devils and the last state may be worse than the first. The boy must be led to consecrate himself to high ideals. The story of a grandfather who dropped in unexpectedly upon his grandson at college affords an instance of how the evil is sometimes driven out by the good. Walking in suddenly upon the boy in his room, the grandfather found its walls adorned with lewd and coarse pictures. He looked around in amazement but said nothing to the embarrassed youth. When Christmas came, however, he took occasion to present his grandson with a beautiful picture of the Christ, handsomely framed, with the request that he hang it on the wall of his room. When he next visited him, he found the character of the pictures on the boy's walls entirely changed, and the boy confessed that he could no longer endure such pictures in the presence of that face.

Intellectual Characteristics

1. *Imagination.*—The adolescent boy is possessed of a lively imagination and has a tendency to speak and act in the superlative. A knowledge of this characteristic will keep the teacher alert, save her much useless worry, and enable her to check the tendency by indirect methods. For instance, in her conversation or teaching she may quote the exaggerated statements of newspaper reporters and show what harm disregard of the plain truth has done. Then by her own careful speech and example she may exert over the boys an influence that will speak louder than words. The teacher that comes to school in the morning saying that she has just seen something that made her "hair stand on end" and her "heart stop beating" and that she is "almost frozen to death," while at the same time it is clear to all that she is enjoying her usual health, must not be surprised if her boys are given to romancing.

2. *Instability.*—It is difficult to hold the adolescent boy steady. So many possibilities present themselves that he

dwells upon no one thing for any length of time. Although this instability is most trying to the teacher or parent, it is a most hopeful characteristic in one sense because by it the mind is kept open and broadened. Again, if a boy has fallen into undesirable ways, it may be taken advantage of to direct him into other channels. He is not confined to a rut and his capacity for doing that which is right is as great as for doing that which is wrong. However, it is not advisable to encourage a boy to be a "Jack of All Trades" intellectually any more than physically, and he should be held by authority for a definite length of time to that which he has undertaken in order that a continuity may be established in his life.

Sometimes the migratory instinct asserts itself strongly and the adolescent boy may desire a change of scene and surroundings as well as of occupation. The parents should not be heart-broken because the boy insists upon leaving home, but, when they see that he is determined to go, should further rather than hinder his plans and thus be able to keep in touch with him and give him counsel in time of need. Sometimes a former teacher may do a great deal to keep a boy who has left home in the straight path by corresponding with him, and letting him know that she has faith in him and expects things of him. It not infrequently happens that a boy who is deaf to the entreaties of his parents will value the advice of his teacher. Perhaps the best cure for the wanderlust is to let the boy go and try his fortune in the world.

Fickleness of desire and a craving for variety and amusement may also be classified under the heading of instability. As the kind of recreation in which he indulges vitally affects the character of the adolescent, it is of the utmost importance that he be furnished with amusements which will in no wise lead him into temptation. In this connection I might quote the instance of a number of burglaries, committed by adolescents during a single week in Chicago, having been traced directly to the witnessing of a play, "The Gentleman Burglar," then running in one of the popular theaters. In case a guardian sees that an amusement for which an adolescent longs will be of positive injury to him, it is her duty to use authority in keeping him from indulging in it, provided other methods have no effect. At the same time, however, she should reason with him regarding it, bring before him its bad effects, and if possible, substitute for it something along the same line. In case, however, the pleasure for which the boy yearns is not wholly evil, it is best to give it to him in proper surroundings.

Another instance from the life of the adolescent boy left

to the care of the maiden aunt affords an illustration in point. About a year ago, he and the group of High School boys with whom he associated showed an almost incontrollable desire to play cards, morning, noon and night. It so happened that most of the families to which these boys belonged frowned upon card playing. They not only regarded it as a great waste of time, but feared that it might lead to gambling. The boys were forbidden to touch the cards, but they soon began to play surreptitiously at noon and after school, in cellars and in downtown poolrooms. Finally, seeing that opposition was driving things from bad to worse, the maiden aunt made an agreement with the boys to the effect that if they would promise to refrain from card playing and attend strictly to their lessons during the week, they should have the privilege of coming to her home on Friday and Saturday evenings to play cards from seven until ten. The consent of the parents was gained and the boys came. On these evenings they were left in undisturbed possession of the dining-room, except for the presence of a big bowl of lemonade and a plate of cake. Neither the aunt nor any of the parents, however, retreated from the stand they had taken against card playing and the boys were conscious that this was but a concession to their weakness and that consent did not mean approval. They played two evenings a week at first; later, Friday was sufficient, and before the end of the school term they found that they sometimes preferred to devote even that evening to something else. This last winter not one of them has shown any desire to play cards. This same principle may be applied to amusements other than card playing. However, the question of providing suitable amusements for the young under wholesome conditions, and of safeguarding them against over-indulgence is one that taxes the utmost ingenuity of the guardians of youth.

3. *Reasoning Power.*—The reasoning power of the adolescent boy is active and he no longer accepts without question the opinions and mandates of others, neither does he make up his mind regarding a matter during a sitting. Knowing this, a teacher should not expect to impose her point of view upon the boy. She will meet with better success if she tries to get his point of view, reasons with him, and gives him time to come to conclusions. The old adage,

> "Convince a man against his will,
> He's of the same opinion still,"

holds true with regard to the adolescent boy also.

A wise teacher will not decide upon the punishment to be administered to adolescents without first consulting with them

and making them see the reason for its necessity and justice. One of the prime objects of discipline is to nourish in pupils the desire for self-control and to develop in them the power of ruling their own spirits and living up to their ideals. This cannot be accomplished by the imposition of authority without reference to the opinions of those controlled.

4. *Narrow-Mindedness.*—The intellect of the adolescent pounces upon a few things which it emphasizes unduly to the exclusion of others. As the root of the evil lies in the fact that his knowledge is so limited, the best remedy is to broaden his mind and increase his intellectual store by conversation, reading, or lectures given by persons holding different points of view.

Allied with this narrow-mindedness, we often find exclusiveness of association, and a devotion to the ideals of a group with but little thought of the outside world.

Social broadening, the meeting of people in various walks of life, of varying religious and political views, and if possible of different nationalities and races, is the best antidote for this. While a wide social acquaintance and foreign travel are not always possible, books are within the reach of all, and through them, the boy may be brought into touch with other minds and peoples.

A child should not be reared exclusively in the society of adults as was Eugenie Grandet in Balzac's novel. Neither should he be permitted to room constantly with a single companion in a boarding school. As the adolescent often learns more from those with whom he associates than he does from his teachers, the influence brought to bear upon him should be varied. If a boy envies a desire to be a member of a "gang" or other exclusive society, it is well to try to substitute for this an interest in an athletic society, the Y. M. C. A., or a literary society in which membership is open to all and the spirit is democratic.

5. *Credulity and Trustfulness.*—These are characteristics of early adolescence which it is desirable to preserve to some extent. So long as a thing will do a boy no positive injury it is best not to protect him continually from the results of his own acts, but rather to let him drive a bad bargain or in other ways take the consequences of his own credulity, in order that experience may teach him that all things are not what they seem. However, a teacher should discuss things with a boy and instruct him through the experiences of others. Sometimes, in later adolescence, the boy becomes skeptical and loses faith in God and in humanity. In such case, it does little good to argue with him. It is better for the teacher to put

before him solid truths, to keep him in touch with biographies of men of faith, such as Abraham Lincoln for example, and to show by her own life that she has faith. The pendulum will generally swing back again and the boy outgrow the pessimism of his adolescent days.

Emotional Characteristics

1. *Fondness for the Opposite Sex.*—This trait should by all means be preserved and a parent or guardian should not take it too seriously and violently oppose the boy who falls blindly in love. Such a boy stands in need of counsel and he should be made to understand that the possibility of his marriage is yet a long way off. Every effort should be made to transfer this affection to the intellectual realm. When a boy sees that he is not opposed, he generally meets one half way. If he can be brought to look upon his fancy for a girl as "just a friendship," her companionship will often have a refining and elevating influence upon him. One hopeful thing about a boy of this age is that he is just as liable to fall in love with his teacher as with a girl of his own age, and this opens the way for a sensible, older woman to exert a lasting influence over him.

2. *Religious Ardor.*—Adolescence is the time of religious enthusiasm. Although a boy may have been reared in a religious atmosphere, the wonderful gospel truths now dawn upon him in their fulness and for the time overwhelm him, sometimes leading him to do things which older persons consider extreme. I have known of adolescent boys who attended as many as six services on Sunday and were to be found at the church nearly every evening in the week besides.

This is a critical time in the boy's religious life, and if his aspirations are now stifled, they may never again be awakened. Our Young People's Societies fill a great need here by furnishing opportunity for the young to meet together to formulate their beliefs, talk over their experiences, and encourage each other in striving after a better life. Through their pledges, they give the individual something definite to do for the nourishment of his spiritual nature, and through their missionary and social activities, he finds a practical outlet for his enthusiasm.

Under no consideration should a boy's religious enthusiasm be made a subject of jest. A few years ago, there lived in Berkeley a minister of the gospel who drove his two adolescent sons from the church and caused them to believe that there was nothing in religion, by ridiculing them for reading their Bibles on the ferry boat when crossing to San Francisco.

Having been laughed at before their church friends these sensitive boys sought other society and from that time began to lead aimless lives, one of them becoming addicted to the use of strong drink.

Some parents and heads of boarding schools make it a rule that the adolescent children under their guardianship shall attend the church with which they are connected, irrespective of the preferences of the young people themselves. As a result the latter often lose not only their enthusiasm but their interest in religion. If that which is best in the boy is to be brought out he should be permitted to attend a church where his spiritual hunger can be satisfied, irrespective of petty differences of form and creed.

3. *Sympathy and Charitableness.*—While it is desirable that these characteristics should be transferred from the realm of the emotional to that of the intellectual, great care should be exercised to prevent their becoming atrophied, and the heart of the adolescent hardened in the presence of poverty and suffering. When the sympathies are aroused, the achievement of some practical result by which matters are improved should be the end in view. There is evil in a course of moral lessons that overworks the sympathies, and care should be taken not to deaden the sympathies by the recital of woes that have no connection with the life of the boy. For example, constant and detailed accounts of the atrocities of the Turks in Armenia or of famine conditions in isolated parts of India or China where it is difficult to send food, should not be used to work upon the sympathies of an adolescent. An effort should rather be made to stimulate that kind of sympathy which is evoked by tales of heroism and loyal service.

4. *Sanguinity and Daring.*—A boy plunges into a thing without either counting the cost or considering the means. His own experience is limited and he is often unwilling to profit by that of others. In such cases opposition is vain, and the teacher or parent cannot do better than to lend herself to his scheme and try to help him work it out. She can then at least retain a guiding hand upon the rudder and steer him clear of many shoals. A short time ago I had an experience of this kind myself with a former pupil. He had set his heart upon giving up his position, borrowing money, entering into partnership with another young man whose inexperience equalled his own, and starting a business. After having told him that if I were in his place, I should not think of doing such a thing, and having seen that counsel would be wasted, I applied myself to helping him lay plans for fitting up the store. The array of figures that I was able to muster startled

him, and after he had thought it over for a few days, he advised his would-be partner that it would be better for them to keep on working for salaries for a time longer at least. The impractical scheme was thus abandoned. I am certain, however, that had I openly opposed him, he would have felt that I lacked confidence in his ability and judgment and would have failed to consult me further.

Sanguinity and daring are, however, qualities to be preserved as they often prove invaluable under circumstances demanding quick and unhesitating action. Moreover, the boy who "hitches his ladder to the stars" is a much more agreeable member of a household than one who is pessimistic and lacks the courage of venture. Our aim should therefore be to direct rather than to crush these characteristics.

5. *Irritability.*—The adolescent is often quick-tempered. He hates with intensity, and his desire for victory prevents his considering a situation calmly. One way to check this is to afford little occasion for its exercise. A teacher should try to avoid coming to an issue with a boy. Again, much depends upon the atmosphere, and if the teacher be herself calm, reasonable, and self-controlled, the boy is likely to keep his temper in check. It is frequently the case that a fiery-tempered boy becomes, through self-control, an even-tempered man. In such a case, old instincts have withered and new ones have taken their place. A boy may be educated to better self-control and more reasonable ways of looking at things by discussing with him stories of men who were patient under injustice and came out conquerors, and of others who acted in haste and repented at leisure. Illustrations may be found in the lives of persons about him which will convince him that it neither pays nor adds to his dignity to be quick-tempered.

6. *Selfishness.*—This is a common adolescent characteristic. The boy often desires to have the lion's share and to do that which suits his pleasure, irrespective of the rights of others. This selfishness is often the result of thoughtlessness. Sometimes it is a good thing to let a boy see himself as others see him, and to help him plan little acts of kindness and attention to others.

An instinct that may be called upon to do battle with selfishness is sympathy. The relation of a story of tyrannical conduct will cause the boy's mind to revolt against the unmanliness of the character of the tyrant and glow with sympathy for the victims. Interests outside of self should be developed and the achievement of some practical result aimed at. Some theory of social welfare and right relation of the individual to those about him should be formed.

7. *A Strong Sense of Personality.*—Under this heading may be grouped self-consciousness, a sense of honor, self-importance, and unwillingness to retreat from a position or to admit that one is wrong.

Knowing that adolescents are self-conscious and very sensitive, a teacher should be careful not to hurt their feelings by little sarcastic remarks, etc. Criticisms made in class should be general, and individual reproof should be given in private. It more often happens in the case of the adolescent boy than in that of the girl that self-consciousness makes it well-nigh impossible for him to stand and recite what he knows, especially if the other members of the class are permitted to act as critics and to "giggle." While in the lower grades it may aid in the concentration of attention to have pupils point out mistakes in a recitation, it is not good policy in the High School. In dealing with adolescents it is wiser to endeavor to improve the quality of recitations by commendation of those that are good than by criticism of those that are lacking. A word supplied by the teacher here and there will help the stammering tongue and aid the boy in overcoming his embarrassment.

Self-respect and a sense of honor are adolescent characteristics which must be fostered. Here again, the teacher's example is worth more than her precept. History, Literature, and Ethics may be used in helping the boy to formulate a standard of conduct. In ethical discussions some introspection may be good, but much subjective work is not to be recommended because of self-consciousness. It is a splendid thing for a teacher to put her boys upon their honor with regard to behavior and it is sometimes well to reprove them by merely saying, "You have forgotten yourself." The boy's conduct is then the result of an inner impulse, and discipline is not a match of wits between him and the teacher.

Self-importance, while a far more desirable characteristic than self-depreciation, should be toned down gradually by giving the boy more knowledge and by bringing before him the life-stories of the great. In his limited social group he has only his fellows with whom to compare himself, but as his horizon widens he is enabled to form a more rational estimate of himself. His self-confidence must, however, be retained even at the risk of his over-estimating his abilities.

Snobbishness is a most disagreeable form of self-importance and it devolves upon the teacher to use her best efforts to overcome this. I once taught in a Junior College for boys in which at the beginning of one semester this undemocratic spirit crept in like a serpent. Certain of the new-comers who belonged to well-to-do families looked down upon those who

could not afford to dress so well as they. We teachers felt it imperative that this spirit be eradicated without delay. The president of the college fired the first gun by coming to school in a faded blue hunting jacket and by taking occasion to remark at the student body meeting that in his dealings with men, he had often noticed that those who lacked intellectual ability tried to make up for it by the wearing of fine clothes. He then made a humorous comparison of such men with the peacock who has a small head but displays numerous gorgeous tail-feathers. The teachers also wore plain clothes. The boys took up the thought and applied it, and the old feeling of comradeship and equality was re-established.

The sense of personality makes it more difficult for the adolescent than the adult to acknowledge that he is wrong. Knowing this to be a fact, the wise teacher will not force him to the point, but will try to influence him by example and give him time to come to a conclusion by himself. Even if he is not brave enough to acknowledge his error openly, he will doubtless feel a shudder of self-contempt which will act as a safe-guard against repetition.

The desire for victory should not be stimulated by pitting one individual against another in debate and in contests for prizes. Team work in both intellectual and athletic pursuits fosters a better spirit. When students can be brought to see that victory over self is more commendable than that over another, a step has been taken in the right direction. The atmosphere of the class-room has much to do with either the development or suppression of this trait.

Chinese tradition holds for us a beautiful story of the reign of the Emperor Wen Wong which illustrates the influence of the social atmosphere upon conduct. Wen Wong was noted for the wisdom with which he ruled his kingdom, and two of the princes of neighboring states having difficulty over their boundaries, decided to lay their quarrel before him. Upon entering his domain they were so impressed by the way in which his subjects yielded to each other and set the rights of others before their own, that before they had reached the capital, they had already settled their difficulty. They, therefore, returned home without seeing Wen Wong.

8. *Restiveness Under Authority.*—In the later years of adolescence, boys are often fractious and restive under authority. A boy of this type cannot be driven, but will do well if permitted to take the initiative. An outsider is generally able to exert more influence over such a boy than his immediate relatives. The Chinese would deal with such a case by filling the mind of the boy with the sayings of their philosophers

regarding the conduct of the "Superior Man" and by having some respected member of the clan (group of villages) talk with him in a friendly way. So great is the respect of the Chinese youth for his elders and so anxious is he to stand well in his clan that this often suffices.

However, in dealing with unruly American boys we have not these conditions to aid us, and the method pursued by the Japanese will perhaps throw more light on our problem. They send the unruly boy to live in the family of some friend, and the changed conditions usually bring about the desired results. In fact, the Japanese often exchange even those boys who are not difficult to get along with for the sake of the influence that is exerted upon them by living in the families of strangers. It is a common saying throughout Japan that a boy never becomes self-reliant until he has "eaten rice with strangers."

I have often known of American boys being sent to boarding schools or military academies with good results. A few years ago a widowed friend of mine who had an uncontrollable boy sent him East to her brother. After about a year he returned, a man in every sense of the word, and he has since been the mainstay of the family. We may therefore conclude that one effective method of dealing with a boy who is hard to manage is found in change of environment. By being placed among strangers who do not look after his comforts and cater to his whims as his mother has, he is thrown upon his own resources and forced to become more serious and self-reliant.

Summary.—The main points of this paper may be summarized as follows:

1. The object of discipline is to nourish in the adolescent the power of self-control.
2. Adolescents should be led by indirect methods and example, rather than forced.
3. Their minds should be filled with the good and pure, solid truths should be set before them, and sound instruction and timely warnings given them.
4. They should be held to some definite line of work or study.
5. They should be given opportunity to think, act, and gain experience for themselves.
6. Their religious enthusiasms and preferences should be respected.
7. A cordial relation should be maintained with them, and help afforded in the working out of their problems.

THE FACTORS OF MENTAL DEVELOPMENT, CONSIDERED FROM AN EDUCATIONAL STANDPOINT*

By W. H. Winch

Educational theory—an unprejudiced observer seems bound to confess—appears as a sort of see-saw through the ages; there is little continuity; but much assertion and counter-assertion.

So long as the life of communities is varied and changing; so long as the ideals of life itself are subject to change, so long must we expect a measure of dispute in the philosophy of education. But the bounds of the dispute may be made more definite, and the disputes themselves may be narrowed to clearer issues if scientific method be applied to the estimation of the facts, which the various schools of thought adduce in support of their respective ideals. Among the basal questions in educational theory are those broad issues which we may call the factors of mental development or growth. What are those factors? One is almost tempted to try to answer by a treatise *de omnibus rebus*. But obviously, capacity and time and space forbid. One can produce only an outline sketch. What is the present position? We have swung violently—in theory, at least—from a belief in the all-sufficing efficacy of environment, educational or otherwise: we have ceased to believe—in the nineteenth century sense—that man is a 'reasonable' being: we have frankly accepted instinct and impulse, conative tendencies rather than deliberate and considered volitions as our educational bases, and to some this anti-intellectualist trend in education seems to have overshot the mark. But there is one common ground for all educationists, of whatever school: they can write in the attempt to discover what the factors of mental development are, and how much each factor contributes to the effects desired. I do not intend to re-introduce you to a discussion of minute and difficult questions in psychological and biological termin-

* This article was written for the Fourth International Congress on Home Education, which was to be held September 22-29, 1914, in Philadelphia, but which was postponed indefinitely on account of the European war. It is here printed with the consent of the author, Dr. William H. Winch of London, England.

ology. As soon as one begins actual research in schools, we find it necessary to work with broader and more practical concepts, and in this the man of science and the teacher are at one. But they often diverge when there is an attempt made to estimate the value of their concepts quantitatively. Much if not most of the mental development which, as a body, teachers accept, without question, as the results of their training are probably due to another factor altogether, namely, that of *spontaneous growth*—the inner ripening of the organism without any form of external stimulation. As teachers say "The boy cannot learn, he hasn't got the brains." Thus they emphasize this factor of inner growth negatively. They are not so ready to accept it positively. They point to brilliant successes in college and in life as a result of their teaching, and are not so ready to argue that the boy succeeded because he *had* got the brains.

First then, let us accept as one of our prime factors that of spontaneous growth or inner ripening. I suppose I ought to say how much is due to this factor, or to indicate how such an evaluation may be made. Well, at one time we were rather hopeful that such an estimate might be made if we worked from the structural or anatomical side. But the very progress of physiological psychology itself has weakened our hopes, and we now realize the necessity for approaching the question functionally. But here we are in a difficulty: we cannot isolate human beings from all environmental influences. There are extant stories of children who ran away from social influences early and who are said to have suffered much mental retardation. Doubtless they did lose much but their number is too small to yield us a valid statistical result, and no exact or even approximately exact knowledge exists as to the condition of these wild human specimens *before* they escaped. It might indeed be fairly argued that they were of very primitive type congenitally in order to want to do so. A comparative psychologist may invite us to turn for guidance to work on animals; which *can* be isolated in sufficient numbers to yield valid evidence. But would not educationists who accept conclusions drawn from the lower animals as applicable to the human animal lay themselves open to a severe and scarcely answerable rejoinder? Those who think more of environmental influences than of spontaneous growth in education might fairly say that the great difference between animals and man lies just there; the animal is instinct-driven, the man educable and reasonable. And though belief in the non-educability of instinct-driven animals does not stand where it did in the last century and though man, too, is now

recognized as instinct-driven, the plea must be admitted as relatively correct. We are forced then to deal directly with the growing man. Herein lies one great justification for child-study investigations and pedagogical experiments, both of which have suffered from the shafts of ridicule aimed at them by the learned. But if we dislike the criticism we can still learn from it, and it behooves those of us who press forward the child-study movement to be cautious as well as progressive and not draw conclusions on slender evidence. We had best therefore say that we are unable quantitatively to estimate the strength of our first factor, for we cannot isolate the child—for experimental purposes—from all social environmental influences. But he can be brought up, and indeed, often is, without the direct pedagogical instruction of the school. Let us not, for one moment suppose that such a child is receiving no education. I do not speak now merely of the educative influences of the external material world, but of the social educative influences of his family and of his fellow children. This is, indeed, the second prime factor which I ask you to consider—the factor of *social environment* outside the school and apart from that of direct pedagogical instruction or training.

Fortunately a direct experimental method now becomes possible. We can, if we have an educational system elastic enough, measure the mental progress, accepting either psychological or pedagogical tests, of those who enter school early and of those who begin attendance at school later. I have endeavored to do this for young children in my monograph on *When Should a Child Begin School,* which is issued by Warwick and York, Baltimore, the publishers of the *Journal of Educational Psychology.* Suffice it to say that the inquiry was laborious and protracted, but the result a clear one. There is no scientific justification for any nation to spend much money and social service on the very early education of young children in school. We cannot say the more teaching the more progress. But if the school is not responsible for all the benefits that have been claimed for it, if our third prime factor—that of *pedagogical environment*—is not so productive of good as was once thought: neither probably, is it productive of so much evil as it is the fashion in some quarters, now-a-days, to assert. Eyesight is failing, is it due to learning to read? No evidence has been advanced based upon a method of *equal groups* to show that it is.

Though we cannot deal directly with our first factor in isolation and though the influences of our first and second factors are only with difficulty isolated from that of our third

factor, the case is otherwise within the field of the third factor itself. Herein we can definitely experiment: we must abandon the method of guess-work, and teachers are entitled before being directed to adopt methods of teaching and learning, to ask for the evidence on which the directions are based. It is quite true that psychology itself has valuable suggestions to offer: but it is also quite true that it leaves the educationist too much in the dark. For instance: a good deal of measurement of mental functions has been done, yet some hold that mental development in one function has little influence on that of another—the mind, they say, is a congeries of more or less independent functions: others hold that the mind is a unity or at least consists of somewhat unified groups of functions, interrelated and interdependent. May I make one suggestion in passing. High numerical correlation between mental functions may not mean inner mental connection. It is possible for example, to improve accuracy in numerical computation without thereby improving arithmetical reasoning (two highly correlated functions), as I have endeavored to show in the *Journal of Educational Psychology*. I am not belittling numerical accuracy; our English schools are suffering from the lack of it, but let us obtain it, if at all, for its own sake, not for the sake of a mysterious faculty called accuracy which will forthwith spread to all branches of study. On the other hand it has been asserted that visual apprehension and memory cannot be trained. Personally I do not believe this and have presented experimental evidence in the *British Journal of Psychology* which appears to me to show that it can, *so far as children are concerned*. I have led you, I fear, into the thick of the disputed questions known as the 'Faculty Doctrine' and the doctrine of 'Transfer:' the way out lies through experiment with equal and correlated groups in the schools themselves. If I might venture to forecast a solution it would run somewhat thus. There will not be found enough transfer to justify a curriculum based upon it. The education of a 'scholar and a gentleman' will not suffice for everybody. But taught in certain ways, the things we need to know, both for 'life' and for 'college' will be found to have certain valuable transfer effects.

But we do not know yet. And precarious inference is often all that the educationist has to rely on. For instance, the same brain centre, it is said, operates language and mechanical dexterity: therefore it is argued, improve the one and you thereby improve the other. This may be true, but where is the evidence of transfer? I need not multiply instances: every educationist knows them.

And when one passes from these big issues to the minor ones of school method, the situation is scarcely bettered. We all agree that civilized children should be taught to read: but how? "Teach this way" says one authority, "No, that way," says another of equal eminence. The bewildered teacher—in England, at any rate—does find a way out—a very bad way. He sticks in practice to his old way, right or wrong, and lets the other ways do duty on special occasions, if the views of his inspector are known. But experiment *with* the teachers in their schools, and you will find alert criticism and eager help.

I am painfully aware of the inadequacy of this paper. I have presented you with a programme rather than a performance. There are only one or two scattered references to items of execution; but if I have succeeded in making clear how little I know either of the quantitative value of the great factors of mental development or of the results of the minor factors of training involved in school methods, the paper will not have been written in vain.

VISUALIZED OPPORTUNITY

By A. M. Boggs, M. A.
Assistant Director Bureau of Commercial Economics

The crying need of this age of materialistic specialization is opportunity. Ever have the great-minded men been seeking to make straight the crooked paths, to bring light into darkness. For the past fortune has chosen the few, selecting those whose forefathers she had favored and rarely seeking amidst the crowd for new recipients of her gifts. From the sweatshops and factory, from the farm laborers and railway gangs; from the grammar school pupils to the graduates of colleges and university, arises the cry, ever swelling as the flowing tide, "Give us opportunity."

The world has heard the cry and has sought to answer it with training schools and charities. That the boys and the girls as they enter the business world may be better equipped to compete, vocational schools have been instituted in which excellent training in a few specific subjects may be had. The high schools were the first to profit by the new departure in education. But the number of children, 23 per cent., that receive any training in the high schools[1] was too few to reach the heart of the situation. Industrial and vocational training, proving its efficacy by the few that had been fortunate to receive it, is now being introduced in the elementary grades. Boston, for example, has its "pre-vocational schools" and Philadelphia about forty-two such elementary vocational centers. But again only half of the school population received the benefit. The American Federation of Labor, in the annual convention in Rochester, November 19, 1912, urged "a greater interest in the education of the twenty-five million children of school age in the United States, 50 per cent. of whom leave school by the end of the Sixth Grade at approximately fourteen years of age."

The loss of 50 per cent. of the school population has been estimated by the National Association of Manufacturers in its meeting of May 21, 1912, to represent $250,000,000,000 of human resources[2] and to counterbalance the fearful waste

[1] Report Commissioner of Education, 1912, two volumes. Washington, 1913, Government Printing Office, p. 481.
[2] Minutes National Association of Manufacturers, May 21, 1912.

of labor capital, the National Association of Manufacturers have founded and systematized corporation schools. They pledged themselves "to the development of a modern apprenticeship wherein by contract the respective and equal rights of employer and employee are fully recognized, the entire trade is taught, together with such other subjects as are essential to good citizenship.[3] They have likewise endorsed thoroughly the continuation schools. The continuation school is indigenous to the soil of Germany. It has been transplanted into the fertile ground of Wisconsin and Ohio and has grown under the new climatic condition, even more hardy than on its native heath.

The fundament of the continuation school is, as its name suggests, a continuation of school work by those who through necessity or choice have entered the wage-earning world. The statute governing continuation schools requires the attendance of all employed children, in some instances until the age of sixteen, others eighteen years, for a specified number of hours throughout the week, which hours must all be done in and completed by daylight, and employers are required to pay their employees for the time thus consumed in school. The curriculum covers a wide field and iincludes cultural studies such as English Literature, French, German and Art. The whole idea is to give a more complete concept of life, a more fundamental philosophy of the art of living.

Continuation schools in the United States are, however, still in the experimental stage. The State of Wisconsin, under the able supervision of Mr. H. S. Miles, has perhaps made greater progress in this direction than any other part of the country. Teaching a trade as a whole balanced by cultural work will certainly make men and women approximate more and more the economic goal, a self-sufficing economic unit.

But there are still thousands and thousands of individuals who must be led to a situation, for whom no provision is made. The great army of the unemployed, the criminally employed, clamor for opportunity. Charity in the form of personal assistance is able to reach but a few. Is it not possible to find some preventative of pauperism rather than a palliative? The modern schools of medicine no longer endeavor to cure but strive to remove, eliminate, eradicate and prevent those conditions that are conducive to disease. Their efforts are concentrated on a healthy environment and a normal individual. So it must be in the industrial world. To prevent unemployment, begging and all the kindred evils that

[3] Idem.

result from the present economic conditions, some note must be sounded which shall be the keynote of a new harmonic development that will permit every individual, man, woman and child, to react to his fullest capacity in a clean, healthy and normal atmosphere.

"The greatest difficulty in American life is the inability of the man to discover before life is over his real work in the world." Thomas R. Marshall, Vice-president of the United States, has here touched the weak link of the industrial system, for the majority of the younger generations are forced through economic pressure, or through chance, to select the employment which is at hand, irrespective of their native penchant and ability. A young man, influenced by a desire to please his parents, studied engineering with considerable outlay of capital in money and time, only to discover that he is discontented and a failure; that his real vocation is secretarial work. Had he had an opportunity, when a boy, to see all forms of work, with their complicated details, had he been informed of each trade and profession, just what the difficulties were, he might have detected his real place in the world. As the Hon. Miles M. Poindexter, United States Senator from Washington, says: "To my mind one of the greatest educational problems of the day is fitting the boy to the job. Too many of our young men are being graduated from schools and colleges educated for a work they will never follow, because they are not suited to it and uneducated in the lines where they might have made a great success."

Maladjustment, patent on all sides, must be remedied. The economic waste is too great to be permitted to continue. "What is the panacea" is the problem that has agitated the mind of educators, masters of industry and of all interested in the welfare of society.

The task is not so stupendous as it appears; though it is not possible to house under one roof all the shops of the world, nor is it feasible to take every child to visit and study all the trades that he may make an intelligent selection of his vocation in life, yet it is possible to bring the form, the factory, the construction gang and the ocean liner to the boy through motion pictures. Cinematography is still in its incipiency; it has not yet discovered its richest view of usefulness—the living text book. Every variety of subject may be thrown on the screen except, perhaps, the speculative branches, as mathematics, logic and philosophy. Physical and social sciences are better taught through the eye than through the ear.

The most minute and delicate actions may be photographed;

no movement is too quick or too instantaneous that it cannot be recorded on the sensitized film. There are in existence films that depict the circulation of blood, the typhoid bacteria, delicate surgical operations, diseases of the nervous system, the effect of X-Rays upon the human body; the ionization of metallic compounds, the separation of gases by electrolysis and delicate chemical reactions. Historical subjects, as is well known, lend themselves admirably to dramatization, and what more graphic method is there of studying social conditions than living pictures of real slums in the cities of the world? Consider a moment the comparative possibilities of Cinematography, for Sociology, Geography, and change from book knowledge to practical experience; the broadening influence of world travel is attained, a remote barbaric village in Asia, in the New Hebrides, the actual conditions existent at the South Pole, the horrors of the present world war may all be brought before one's eyes and if these pictures are used to illustrate authoritative lectures and are so arranged that they follow a natural sequence, their value is inestimable.

Educational films abound but the films of opportunity are scarce. Films of opportunity are those which disclose to the observer some avenue of employment. The pictures do more than amuse and instruct; they are the medium by which the job can be brought to the boy. Through them the whole world of industry and commerce, of gainful employment, may be shown on the screen. Dr. Charles W. Eliot, the grand old man of education, has described it as "Doing on a great scale what Benjamin Franklin's father did for his son, who was deciding on the choice of a trade. The father took the boy about Boston and showed him work going on in as many trades as were then represented in the little town. It was only after having seen the work done in the various trades that Benjamin decided to be a printer.[4] A trade is taught as a whole and every detail viewed and reviewed until it is thoroughly mastered. Those actions that require niceness, exactness and delicate execution are enlarged and made visible by the aid of a microscope. A lesson in agriculture, for example, is concerned not only with the actual planting and harvesting of crops, but deals quite as much with geographical locations of soil adapted to any particular growth. Thus the thousands of men and women who are beyond the reach of compulsory education or of the continuation schools may be reached. The president of the Normal School of the City of New York, Dr. George S. Davis, commenting on the

[4] Letter of Commendation Bureau of Commercial Economics, p. 1.

possibilities of this method of information, has declared, "The device for presenting to the people in the representative form of pictures, information concerning the elements of the various trades and occupations, seems to me to be most excellent and ought to be productive of much good. It ought to be most helpful in the solution of the problem of the unemployed. For the instruction will reveal to thousands the unsuspected avenues of effort and suggest to them things they can do. I can conceive of nothing more needful than this nor of a better method of accomplishing it."[5]

The possibilities of moving pictures as a factor in the industrial equation had not until very recently been realized. Some of the larger corporations endeavored by lectures illustrated with slides and motographs to depict to the public the advantages of certain commodities. The International Harvester Co. has done more than any other corporation in this respect; their subjects illustrate the rise of agriculture, of commerce, of power. As a comparative study of ancient and modern methods these lectures are magnificent, but they are not opportunity films. In point of fact there has been no attempt to systematically arrange or present such reels of this type as are extant.

In November, 1913, an educational organization was perfected to make a detailed study of opportunity; to gather the films for this purpose which had already been made and to cause others to be made; to map out a series of studies and to present them to the public in a concise, succinct method, comprehensible to all. In planning these lectures, two principles were followed: To depict fully and accurately the industrial processes and to illustrate how things in common use are made and produced. The syllabus of lectures includes Mineral Resources; Agriculture, Horticulture, Forestry; Animal Industry; Industry; Commerce and Transportation; Domestic Economy; industrial Organic and Inorganic Chemistry; History, Science, Travel and Religion.

An industrial lecture can be made as attractive and interesting as a travelogue. As for example, *Cotton and its Products*. The lecture considers first the quality of soil suitable for cotton and the preparation necessary for a good yield; the pictures on the screen portray the plowing, planting, cultivation, blossoming, picking and hauling to the gin. Then the interior of the gin is shown where the cotton seeds and stalks are separated and each set aside for further operations. The cotton is baled and shipped to the cotton mills

[5] Letter of Commendation Bureau of Commercial Economics, p. 5.

where it is corded and spun either into yarn, and fabrics such as musclin, calico and gingham, and further made into wearing apparel; or is made into batting and absorbent cotton, or manufactured into nitro-cellulose, explosives, *i. e.*, guncotton and celluloid, or woven into artificial silk. Following the seeds, after their reception at the cotton oil mills, they are cleaned, reginned and hulled. The meats are crushed, then cooked and formed into cakes from which the oil is expressed. The oil passes through several purifying and refining processes before it is available as oleo-stearin, oleo-oil, neutral lard, oleomargarine, lard compounds, lard stearins, and soap. The cake, that dry residue kept from the expression, is used as fodder and fertilizer. The hulls in their turn are bleached, ground and bolted and become meal bran, fodder, paper-stock and fertilizer. The stalk of the cotton plant is useful for paper making and basket fibre.

These lectures are not entirely pictorial. To accompany each one is a written, expert explanation which has been prepared by the best authorities in this country on the subject. As an instance, those dealing with organic and inorganic chemistry in industry have been written by the renowned chemist, Dr. Samuel P. Sadtler, who is also making experiments relative to the possibilities of microscopic cinematography in portraying chemical reactions.

To compete with the former method of instruction the motograph text books should be viewed and reviewed and the printed lectures, that have been placed on file in places accessible to the public, should be studied diligently. Visualization from the psychological viewpoint seems to make a deeper imprint on the brain than a printed page. The association centres react with greater alacrity and create a deeper channel through which memory flows more readily. The man, however, who is viewing the films to find something which he is capable of doing, will not, of course, pursue the subject with the same tenacity and concentration as he who is studying a trade.

The second principle involved in the presentation of these industrial films is to show how things in common use are made and produced. Strange, is it not, that scarcely more than one person in a hundred knows that his old kid gloves are made into glue? What is the source of chloroform? The lay mind is blank. It is certainly as important to know the origin of everyday articles as it is for the average person to know that the square described on the hypothenuse of a right triangle is equal to the sum of the square of the other

two legs. Geometry is taught with assiduity, practical knowledge rarely.

"There are plainly great possibilities in the plan as outlined and it will have very great educational value. One of our great defects is our lack of details about industrial subjects. A glance at the list will convince most people there are many things they do not know and which are among the simpler items which make up our present commerce,"[6] says Dr. E. B. Craighead, President of the University of Montana.

The organization which has planned this pioneer educational work, as Dr. Eliot has described it, is the Bureau of Commercial Economics, of Philadelphia, which is founded on a philanthropic basis upon the recommendation of the leading educators and masters of industry of the country to engage in the free dissemination of industrial and vocational information by means of the cinematograph, showing graphically how things in common use are made and produced. It is an association of the leading institutions, manufacturers, producers and transportation lines in the United States and abroad, and is maintained through endowment funds and annuities. The Bureau, which was established in 1913, has gathered from various sources films and slides of agricultural, industrial and commercial interest and has arranged them into courses of study which are to be given in the thirty-four universities and colleges co-operating in the movement; the Bureau has been affiliated with several of these universities and has a student body of over 60,000. When the income of the organization is sufficient to warrant the expense, for no remuneration is accepted from the donors of the pictures for their display or from the institutions receiving them, the work will be extended to the high schools, public institutions, settlement houses, missions, commercial clubs and trade conventions. It is anticipated during the summer to have powerful projectors operated from auto trucks for service in the parks and playgrounds and agricultural districts. In this department the simpler industrial processes will be exhibited as the making of shoes, amply explained by concise headings throughout the films. A man, without employment, may perhaps see one bench at which he can work or can learn to work and then with confidence he enters the factory doors marked *"No Admittance Except on Business,"* for he knows just what he is capable of doing.

The bureau expects to develop extensively a plan to improve the material condition of the negroes of the South

[6] Letter of Commendation Bureau of Commercial Economics, p. 6.

who, by force of circumstances and poverty, have grown to man's estate wholly illiterate. Of these there are great numbers and in communities where no funds are available to enlighten the inhabitants. Still and motion pictures will be shown liberally in the open to these people, depicting the methods used in clearing land, planting and harvesting of the crops indigeneous to the soil of the locality. In the first instance illustrating how it is possible to start without capital, using improvised equipment, and then gradually substituting more modern methods. The use of fertilizers and other safeguards to develop and to protect crops will be advocated. Lastly the negroes will be instructed how to put their truck in commercial packages of standard sizes and the facilities for shipment to the markets of the world. The thought being to initiate effort and industry by portraying graphically the results of such effort.

The illiterates of the back country of the United States, whether black or white, are in desperate need of some sort of economic instruction. The rural schools are by no means adequate to the situation and the use of motion pictures in those districts which are devoid even of a country school house will undoubtedly put these people on a higher economic and cultural plane.

An experimental school for research work is being established to determine the actual value of pictures as a means of education. Eight children, all boys, are being gathered together from the illiterates. They are all about the same age and have had no previous educational training. They will be taught entirely by photography with the exception of those subjects which do not lend themselves to depiction. It is not, however, the intention of those engaged in this work to underestimate the value of books; literature of every type will be supplied to the children as they develop, through photographs, living and still, a capacity to grasp, understand, enjoy and appreciate the things that are more excellent.

A large house in the country in the vicinity of Philadelphia is being obtained in which the children will be lodged and taught. As they enter they will be examined physically and mentally and an accurate record kept of their accomplishment. They are to be fitted for the industrial world and their education, while balanced by cultural training, will nevertheless aim at an economic goal.

Although the Bureau of Commercial Economics is but ten months old, it has already received application from more than a thousand institutions for all of its lectures. The

value of motion pictures is being recognized more and more as an educational factor and particularly in vocational training. In this field its importance cannot be overestimated, for it enables a man to choose his particular vocation without losing valuable time in the old-fashioned trial and error method of selection. The Bureau of Commercial Economics aims at one goal only: to give without expense to the public Visualized Opportunity and to fit the job to the boy.

FIVE HUNDRED FORTY-SEVEN WHITE AND TWO HUNDRED SIXTY-EIGHT INDIAN CHILDREN TESTED BY THE BINET-SIMON TESTS

By E. C. Rowe

In January and February of 1912 the writer directed the work of giving the Binet-Simon tests to 235 children in the lower grades of the State Normal Training School and in one of the ward schools of Mount Pleasant, Michigan. With this group the 1908 scale was used. In January and February, 1914, the tests were again given by the same persons working under the same conditions *with the exception that the* 1911 *scale was used.* Immediately after finishing with this second group the 1911 tests were given by the same persons to 268 children of Indian descent in the United States Government School located at Mount Pleasant, Mich. All of these tests were given by Helen Niles Rowe and the writer. With both the 1908 and 1911 editions Goddard's directions were rigidly followed. Each child was tested alone. No time limit was observed. It was found that kindergarten children could be tested, on the average, in about fifteen minutes while fourth and fifth grade children required from twenty-five to forty-five minutes each. The pictures and weights used were obtained from the C. H. Stoelting Co. of Chicago. The child's age was determined by his nearest birthday. In using the 1908 edition the child's mental age was determined by the highest age for which he succeeded in all the tests save one. In the 1911 tests it was determined by the highest age for which the child succeeded *in all the tests.* In each case the child was advanced one year for each five questions answered correctly beyond the year for which he answered all the questions (1911 ed.) or all save one (1908 ed.).

Comparison of the results obtained with the 1908 edition with those obtained with the 1911 edition does not show any marked differences so far as the general results are concerned. If Binet, Bobertag, Goddard and others are correct in assuming that about fifty per cent should test at age, the general results obtained with both editions indicate that the tests for the years from five to nine inclusive are not difficult enough (Cf. Table VI). However, it seems highly probable

that if the tests for these years were made difficult enough to increase the number passing at age to fifty per cent, more than twenty-five per cent would fall below age. This raises the question of the distribution of ability. Binet seems to assume that the ability of children in general is distributed according to the curve of chance and that therefore the number of retarded should equal the number of advanced children. This assumption has gained widespread credence and in most of the discussions of the Binet-Simon tests is openly held or implied. The writer does not believe the problem is as simple as this assumption would make it. The eugenic studies of the size of families in the different social strata and the studies of retardation in the public schools would indicate that ability is distributed according to a curve skewed toward the side of inferior ability.

Terman and others have obtained results with the Binet-Simon tests showing that the distribution of ability for the younger ages is skewed toward the side of superior ability and for the older ages toward the side of inferior ability. The usual explanation of this difference is that the tests for the early years are too easy and for the later years too difficult. However important this explanation may be there are at least two additional explanations. The first is, that the school and other educational agencies appeal more forcibly to the younger children; that the tests measure acquisition and language ability as well as native intellectual capacity—hence the skewed distribution. The second explanation is that the same functions are not measured by the tests for the early and later years; that the rate of development varies with different functions and that therefore, different functions are differently distributed in different ages. If, as has been suggested recently, mental normality means a *certain rate of development,* further analysis may show that this normal rate varies with functions as well as with individuals. Consequently it is highly important that a series of tests measure the same functions in order that results be comparable and reliable.

Probably nothing is more needed to further the development of reliable tests and standards of general intelligence than a comprehensive study of the distribution of specific abilities by ages for each sex and possibility for each nationality and for different social conditions. This would necessitate the careful testing of a large number of children of each age, sex, and nationality. The importance of the nationality factor is strongly suggested by the results of this study.

Attention is here called to the fact that in all those tests

involving a time limit the Indian children were allowed a longer time than that given by Goddard in the edition of 1911. This was done to avoid the possible criticism that the Indian's reaction time is naturally slower and that this difference in reaction time is the main difference in the two races. The Indian *is* unquestionably slower than the white child; but he differs from the white not only in terms of "readinesses" but in terms of "bonds"[1] as well. The striking difference between the Indians and the two groups of white children cannot be explained by hygienic, social and educational differences. Probably every child in the Indian school was born in a rural community where food is abundant and more easily obtained than in urban communities and where the child leads an outdoor and more nearly natural life. Moreover, many of the children examined had spent three or more years at the government school where good food is plenteous and the school conditions at least average. The children go to school one half day and work the other. The half day of work is also educational in that each child is taught some trade or occupation. It seems therefore that the only satisfactory explanation of their inferiority in terms of the tests is to be found in an inferiority of native ability.

In connection with these results attention may be called to the results obtained by Stone with reference to the influence of social and home conditions in the determination of sixth grade ability in arithmetic. Attention is also called to the fact that the difference between the Indians and whites is much greater than the difference between the white and colored children tested by Morse and Strong.

When it is recalled that these Indian children average much older than the white children with whom they are compared and that the overlapping of the two groups is only slight, it seems clear that the type of education suited to the one is not suited to the other. This position is supported not only by the large quantitative differences, but also by the less evident but real qualitative differences brought out by comparing Table IV with Table V. Such a comparison tends to show that the Indians are relatively weaker in tests involving comprehension and definition than in tests of a more purely perceptual or memory nature. The difference is not however as great as the writer anticipated and tends to support the view that there is a rather high correlation between the various abilities. The Indians are everywhere inferior to the whites.

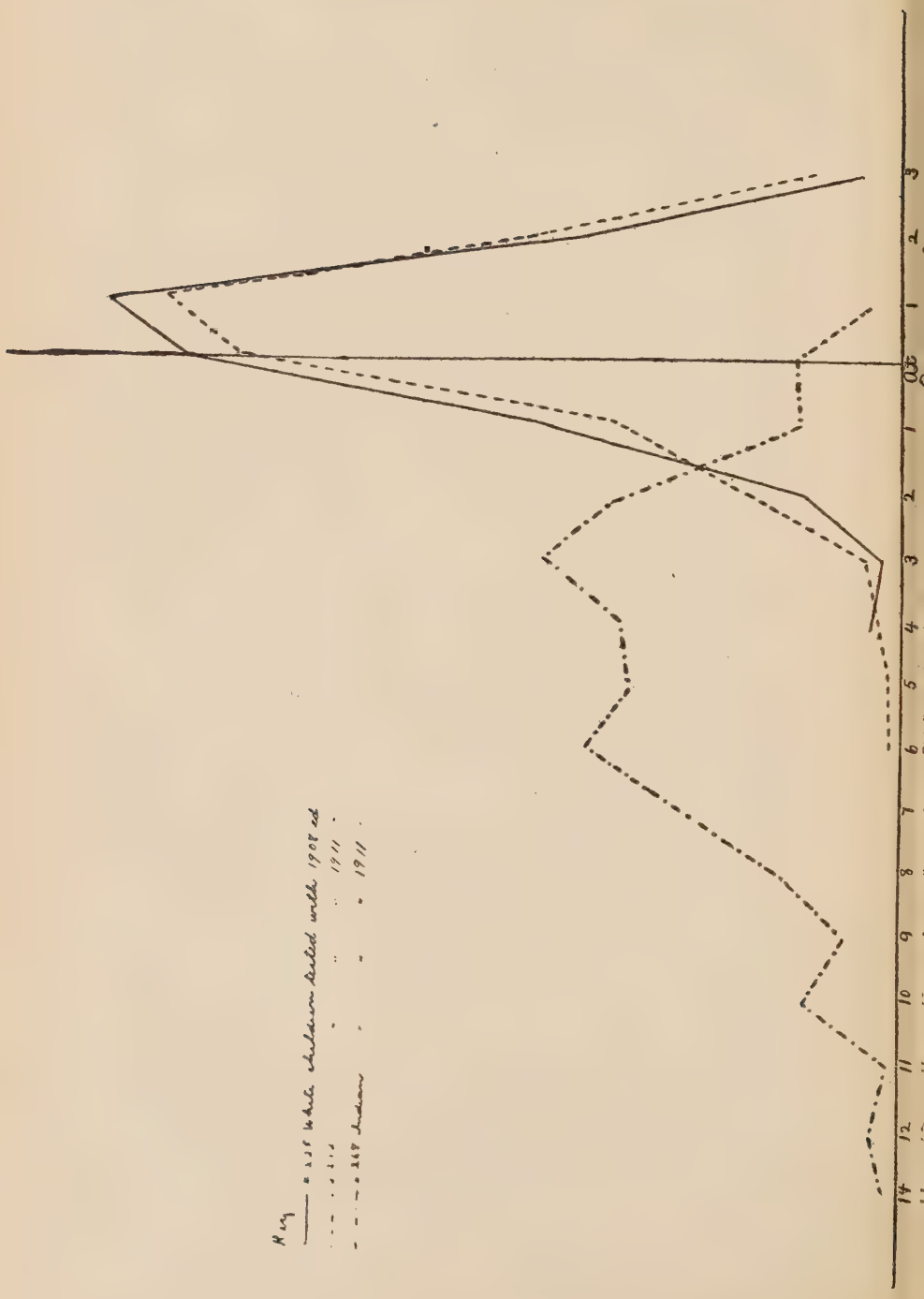
A single comparison will serve to show that, with the present method of scoring, the tests are not always to be relied upon

[1] Cf. Thorndike; Educational Psychology, Vol. II, p. 192.

for accurate data. Two white children from the second grade, a boy and a girl, each seven years old, tested up to nine years mentally. Both passed all of the tests for the eighth year. Of the nine year tests the boy failed on the following: (1) making change, (3) date and (4) months of the year. He succeeded in (2) definition better than use and (5) arranging the weights correctly. The girl failed in the (1), (2) and (3), but passed (4) and (5). Under the ten year old tests the boy failed (3) to repeat the figures, did not (4) comprehend the "-what-ought-one-do" questions, and failed (5) to make a sentence containing the three given words. The girl however passed all the ten year old tests except the (5). Under the eleven year old tests the boy failed in all but the rhymes whereas the girl gave the rhymes *and also the absurdities,* doubtless the most severe of the eleven year old tests. The girl therefore passed eight tests beyond the year for which she passed all, while the boy barely passed the necessary five to get credit for an additional year beyond the year for which he passed all. Moreover the girl passed certain tests—the comprehension tests of the tenth year—which the boy probably cannot pass in six months or a year. The girl is in the best third of the grade, the boy in the poorest third. In order to get further data on these two children they were given three additional tests and a 'comprehension' test based upon the "alternative questions" given by Goddard in the 1911 edition. In the logical memory test the boy made a score of fourteen, the girl of twenty-six. In the opposites, the boy scored forty, the girl sixty per cent. In the comprehension questions the boy answered three and the girl ten out of thirteen. However, technically according to the accredited method of scoring both should be given the same mental age!

This apparent coarseness of the scale which fails to bring out important differences is partly due to the scale itself but even more to the rough method of scoring. Of course no scale will apply itself; skill in interpretation is always necessary. But the present method with the year as the unit for expressing mental age and with its large latitude for interpretation and the "personal equation" can never bring anything like the exactness now obtainable with other tests and methods of scoring.

But in spite of the coarseness the tests are unquestionably of practical service. They have repeatedly been found to be more reliable in arranging a group of children in order of general merit than the judgments of their teachers. They should be of very great service in effecting a classification of children, such as the Indians whose classification must be


Key
1908
1911
1911
0
1
2
3
4
5
6
7
8
9
10
11
12
14

made when entering the government school without reliable records of previous accomplishments. They should also be of service in determining the fitness for promotion of children in the public schools, especially when native mental growth is taken into account, as it should be, in determining the child's qualification to do the work of the next grade.

The details of this study are expressed in the following tables:

TABLE I

SHOWING DISTRIBUTION BY AGES AND GRADES FOR 235 WHITE CHILDREN TESTED WITH THE 1908 ED.

	Total No.	Below Age								At Age						Above Age				Ave.	Ave.	Ave.	Ave.		
		4 yr.	%	3 yrs.	%	2 yrs.	%	1 yr.	%	Total	%	Age	%	1 yr.	%	2 yrs.	%	3 yrs.	%	Total	%	Age	Dev.	Ment. Age	Ment. Dev.
Kindergarten.	61	0	0	0	0	0	0	4	6.5	4	6.5	24	39.3	27	44.2	6	9.7	0	0	33	54	5.18	.54	5.75	.54
1st Grade.....	53	0	0	0	0	5	9.4	9	17	14	26	21	40	14	26	3	5.6	1	1.8	18	34	6.75	.8	6.8	.87
2nd Grade....	54	2	3.7	2	3.7	2	3.7	4	7.5	10	17.8	12	22	18	33	12	22	2	3.7	32	60	7.75	.78	8.2	.78
3rd Grade. ...	33	0	0	0	0	3	9	7	21	10	30	4	12	14	42	5	15	0	0	19	58	9.1	.82	9.3	.66
4th Grade. ...	34	1	3	0	0	0	0	3	8.8	4	12	12	35	10	32	7	21	1	3	18	53	10.3	.93	10.9	.41
Total.....	235	3	1.2	2	.8	10	4.2	27	11.4	42	17.9	73	31	83	35	33	14	4	1.6	120	51	.....	.....	.....	.....

TABLE II

SHOWING DISTRIBUTION BY AGES AND GRADES FOR 312 WHITE CHILDREN TESTED WITH THE 1911 ED.

		Below Age									At Age			Above Age							Ave.	Ave.	Ave.		Ave.	
	Total No.	4 yrs.	%	3 yrs.	%	2 yrs.	%	1 yr.	%	Total	%	Age	%	1 yr.	%	2 yrs.	%	3 yrs.	%	Total	%	Age	Dev.	Ment. Age	Ment. Dev.
Kindergarten...	48	0	0	0	0	0	0	4	8.2	4	8.2	11	22.9	24	50	9	18.7	0	0	33	68.7	5.15	.49	5.9	.56
1st Grade.....	66	0	0	0	0	4	6	6	9	10	15.1	20	30	26	39	8	12	1	1.6	36	54.5	6.7	.77	7	.45
2nd Grade.....	72	1	1.4	0	0	4	5.5	9	12.5	14	19.4	27	37.5	20	27.5	8	11	3	4.2	31	43	8.05	.8	8.3	.57
3rd Grade.....	35	0	0	1	3	3	8.5	4	12	8	23	3	8.5	8	23	12	34	2	6	24	68.5	8.7	1.03	9.3	.76
4th Grade.....	63	5 y.1 6 yr.1 2	3.1	4	6.2	5	8	11	17	24	39	17	27	12	18.6	7	11	3	4.6	22	34	10.2	1.1	9.85	.58
5th Grade.....	28	0	0	0	0	3	8.5	2	7	5	18	9	32	9	32	3	3	2	7	14	50	10.9	.6	11.1	.33
Total.....	312	3	.9	5	1.6	19	6	36	11.5	65	20.8	87	27.8	99	31.7	47	15	11	3.5	160	52	.....	.....	.....	.....

TABLE III

SHOWING DISTRIBUTION BY AGES AND GRADES FOR 268 INDIAN CHILDREN TESTED WITH THE 1911 ED.

	Total No.	Below Age																		
		14 yrs.	%	12 yrs.	%	11 yrs.	%	10 yrs.	%	9 yrs.	%	8 yrs.	%	7 yrs.	%	6 yrs.	%	5 yrs.	%	4 yrs.
Kindergarten	26	0	0	0	0	0	0	0	0	0	0	0	0	2	8	6	24	1	4	2
1st Grade	38	0	0	0	0	0	0	1	2.6	1	2.6	1	2.6	6	16	2	5	5	13	2
2nd Grade	58	1	1.7	1	1.7	0	0	1	1.7	2	3	2	3	5	8.5	5	8.5	7	12	12
3rd Grade	49	0	0	0	0	0	0	0	0	2	4	3	6	1	2	6	12	9	18	9
4th Grade	28	0	0	0	0	0	0	1	3.6	1	3.6	2	7	1	3.6	3	11	2	7	2
5th Grade	17	0	0	1	5.8	0	0	0	0	0	0	0	0	2	12	4	23	3	18	3
6th Grade	17	0	0	0	0	0	0	2	1.2	0	0	3	18	2	12	6	35	1	5.8	1
7th Grade	22	0	0	1	4.5	1	4.5	5	24.5	0	0	2	9	3	13.5	3	13.5	3	13.5	1
8th Grade	4	0	0	0	0	0	0	0	0	0	0	0	0	3	7.5	1	25	0	0	0
Total	259	1	.4	3	1.2	1	.4	10	4	6	2.3	13	5	25	9.9	36	13.8	31	11.9	32
Number Testing above 12 years	9																			

	%	3 yrs.	%	2 yrs.	%	1 yr.	%	Total	%	At Age	%	1 yr.	%	Above Age	Total	%	Ave. Age	Ave. Dev.	Ave. Ment. Age	Ave. Ment. Dev.
Kindergarten	8	5	20	5	20	1	4	22	84	2	8	2	8	2	8	10.2	1.6	6.8	.9
1st Grade	5	8	20	6	16	3	7.9	35	92	3	7.9	0	0	0	0	12.18	2	8.18	.74
2nd Grade	20	11	18.7	9	15	1	1.7	57	98.3	1	1.7	0	0	0	0	13.3	1.8	8.62	.53
3rd Grade	18	9	18	6	12	2	4	47	96	1	2	1	2	1	2	13.8	13	9.57	.74
4th Grade	7	5	18	3	11	3	11	23	82	5	18	0	0	0	0	14.9	1.8	11.25	.95
5th Grade	18	1	5.8	2	12	1	5.8	17	100	0	0	0	0	0	0	15.7	1.6	10.7	.51
6th Grade	5.8	1	5.8	0	0	1	5.8	17	100	0	0	0	0	0	0	17	1.3	10.8	.97
7th Grade	4.5	2	9	1	4.5	0	0	22	100	0	0	0	0	0	0	18.3	1.8	11.18	.9
8th Grade	0	0	0	0	0	0	0	4	100	0	0	0	0	0	0	18	0	11.25	.37
Total	12.3	42	16.2	32	12.3	12	4.6	244	94.2	12	4.6	3	1	3	1	.....	.....	.....	.....

TABLE IV

SHOWING THE PERCENTAGE OF CORRECT ANSWERS FOR ANY PARTICULAR AGE FOR 312 WHITE CHILDREN TESTED WITH THE 1911 ED.

AGE	No.	IV				V					VI					VII					VIII					IX				
		1	2	3	4	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
4	6	100	100	83	67	67	100	83	83	50	33	50	67	33	67	50	0	17	33	83	...	...	...	...	...	...	...	...	...	...
5	34	....	....	....	....	94	85	94	91	85	88	85	85	56	91	65	55	67	38	97	29	3	18	3	24	...	...	...	...	...
6	33	....	....	....	....	100	100	100	97	85	97	85	91	88	100	88	73	85	73	100	64	9	45	24	48	...	...	...	...	...
7	59	....	....	....	....	...	...	...	...	...	100	91	97	91	98	97	95	88	91	97	90	35	73	52	81	12	36	22	30	40
8	55	....	....	....	....	...	...	...	...	...	...	...	...	...	...	98	93	91	96	96	93	58	93	67	82	33	56	56	55	60
9	45	....	....	....	....	...	...	...	...	...	...	...	...	...	...	98	98	100	98	100	87	71	82	73	82	51	60	62	64	73
10	33	....	....	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	100	94	100	91	97	85	94	94	94	91
11	29	....	....	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	97	100	97	93	86	86	90	90	90	76
12	9	....	....	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	78	67	56	67	56
13	7	....	....	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	100	86	100	100	86	57	71	57	43	71
14	0	....	....	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	2	....	....	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	50	100	100	50	100
		....	....	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	84	61	78	67	76	56	71	67	61	71

AGE	No.	X					XI					XII					XV					Adult				
		1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
4.....	6	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
5.....	34	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
6.....	33	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
7.....	59	40	20	17	8	10	5	8	0	25	0	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
8.....	55	60	29	27	25	27	20	25	12	37	24	0	2	0	0	2	....	....	....	....	....	....	....	....	....	....
9.....	45	80	47	44	38	49	47	51	18	56	36	9	4	0	18	7	4	9	0	16	....	7	0	0	0	0
10.....	33	100	82	61	67	79	64	79	33	70	55	21	12	3	24	15	3	9	0	9	....	0	0	0	0	0
11.....	29	100	69	66	72	86	72	79	38	79	66	31	21	14	55	24	17	35	7	42	....	21	0	3	7	3
12.....	9	89	22	44	78	78	89	78	56	56	33	22	11	0	56	22	0	22	0	33	....	33	0	0	0	0
13.....	7	100	100	29	71	71	71	71	29	43	43	0	0	0	29	15	0	15	0	43	....	0	0	0	0	0
14.....	0	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
15.....	2	100	100	0	0	50	50	50	0	100	0	0	0	0	0	50	0	0	0	0	....	0	0	0	0	0
		83	73	36	45	56	52	55	23	42	32	13	8	3	30	22	....	....	....	....	....	....	....	....	....	....

TABLE V

SHOWING THE PERCENTAGE OF CORRECT ANSWERS FOR ANY PARTICULAR AGE FOR 268 INDIAN CHILDREN TESTED WITH THE 1911 ED.

AGE	No.	IV				V					VI					VII					VIII					IX				
		1	2	3	4	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
6	1	100	100	100	100	100	100	100	100	100	100	0	100	100	100	100	0	0	0	0	0	0	0	0	0	...	...	...	...	...
7	2	....	....	....	....	100	100	100	100	100	100	50	100	100	50	100	100	100	100	100	100	100	100	0	0	0	50	0	0	5
8	4	....	....	....	....	...	...	...	...	...	100	75	75	100	100	75	25	75	0	50	0	0	0	50	75	0	0	0	0	0
9	8	....	....	....	....	...	...	...	...	...	87	100	100	100	87	100	62	100	100	87	75	81	81	50	75	25	50	25	87	100
10	16	....	....	....	....	...	...	...	...	...	94	100	100	100	100	100	94	100	100	90	56	90	75	56	75	19	38	31	59	70
11	20	100	95	100	95	90	100	95	100	95	100	85	90	90	90	90	85	85	95	85	75	75	80	70	65	10	45	25	35	85
12	29	....	....	....	....	100	100	97	100	100	86	83	90	86	83	79	72	79	79	76	55	69	72	55	66	38	66	72	79	86
13	41	....	....	....	....	...	...	...	...	...	...	...	...	...	...	100	100	100	98	100	78	88	90	80	85	46	71	78	75	83
14	34	....	....	....	....	...	...	...	...	...	...	...	...	...	...	100	97	100	100	100	76	94	91	85	73	70	85	91	85	94
15	24	....	....	....	....	100	100	96	100	100	100	100	100	100	100	100	96	96	100	100	79	100	100	96	88	75	83	96	96	100
16	28	....	....	....	....	...	...	...	...	...	100	100	96	100	100	100	100	100	100	96	75	82	82	79	79	74	71	79	79	86
17	18	....	....	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	61	61	67	67	67
18	21	....	....	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	90	90	95	95	95
19	12	....	....	....	....	...	...	...	...	...	...	...	...	...	...	100	100	100	92	100	92	92	100	83	83	42	67	100	92	83
20	5	80	100	80	100	100	80	80	100	100	80	80	80	100	100	100	100	80	80	100	80	80	100	80	80	80	60	80	80	80
21	4	....	....	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	75	75	100	100	100
22	1	....	....	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		....	....	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	74	82	88	64	71	57	72	74	84	99

AGE	No.	X					XI					XII					XV					Adult				
		1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
6.....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
7.....	2	0	0	0	0	0	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
8.....	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
9.....	8	62	62	12	0	0	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
10.....	16	0	0	0	0	0	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
11.....	20	80	55	10	5	5	10	5	5	5	5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
12.....	29	83	76	28	24	17	21	14	7	17	7	7	3	0	28	10	11	10	0	14	....	7	0	0	0	0
13.....	41	83	66	36	32	29	19	17	0	15	24	12	0	10	17	10	10	15	0	17	....	5	0	0	2	0
14.....	34	94	79	47	47	32	35	27	21	42	39	9	6	6	42	18	18	24	0	24	....	12	6	0	9	0
15.....	24	100	88	58	58	54	50	50	29	37	54	21	4	12	42	17	25	12	0	42	....	8	0	0	4	0
16.....	28	90	82	74	50	54	50	50	36	43	53	28	18	21	32	39	25	18	7	36	....	21	0	0	14	0
17.....	18	67	67	56	56	50	44	50	33	38	44	22	17	17	17	22	17	11	5	28	....	5	0	0	0	0
18.....	21	95	85	85	70	70	65	55	45	65	65	60	29	40	60	33	33	29	0	16	....	14	0	0	0	0
19.....	12	100	83	50	58	50	42	50	25	33	42	17	8	0	50	25	8	25	8	17	....	0	0	0	0	0
20.....	5	80	80	40	80	80	60	60	60	40	40	0	20	0	40	40	40	40	0	40	....	0	0	0	20	0
21.....	4	75	100	75	70	75	50	50	0	25	50	25	0	0	25	50	0	0	0	20	....	0	0	0	0	0
22.....	1	....	....	....	....	....	0	100	100	0	0	100	0	100	100	100	....	....	....	....	....	....	....	....	....	....
		85	78	51	50	47	37	44	30	30	35	27	9	18	41	33	....	....	....	....	....	....	....	....	....	....

TABLE VI

SHOWING THE MENTAL DISTRIBUTION AND THE PERCENTAGE TESTING AT AND ABOVE AGE FOR EACH CHRONOLOGICAL AGE

	5 yr. Olds		6 yr. Olds		7 yr. Olds		8 yr. Olds		9 yr. Olds		10 yr. Olds	
	1911 ed.	1908 ed.	1911	1908	1911	1908	1911	1908	1911	1908	1911	1908
Below 2 yrs	0	0	0	0	0	2	1	4	3	2	1	1-3 yrs. below 0
" 1 yr	0	1	4	5	3	5	7	4	6	7	8	5
At age	5	11	6	22	21	12	20	11	13	6	12	6
Above 1 yr	20	13	18	17	21	8	11	15	15	8	10	7
" 2 yrs	9	3	5	4	9	5	13	8	6	7	2	1
" 3 yrs	0	0	0	2	5	0	3	1	2	1	0	0
Total	34	28	33	50	59	32	55	43	45	31	33	20
Percentage testing at age and above	100	96	87.8	90	95	78	85	81	80	71	73	70
Ave. mental age	6.1	5.6	6.7	6.5	7.8	7.3	8.67	8.5	9.46	9.45	10.1	10.05

THE PSYCHOLOGY OF PLAY*

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Several causes have suddenly revived our interest in the psychology of play. One of these is the rapid extension of the play-ground movement. A new art has come into being, —the art of directing the play of children. A new profession has appeared,—that of play-leader, employing already more than 6,000 people in the United States.

Another cause is the amusement craze, which seems to be sweeping the country. Its most virulent form is seen in the dancing mania, which has passed through various stages in America. Next to this in psychological interest is the moving-picture craze, which has seized the world like an obsession. Motoring, again, as a form of amusement, still holds the interest of a very large number and aviation is to some extent practiced or witnessed as a pastime. Just as we thought the world was getting very serious and settling down to work and to problems of social and individual welfare and to political and moral reform, it has suddenly gone amusement mad in America and reverted with unparalleled ferocity to primeval bloodshed in Europe.

This increased desire or need for some form of relaxation is not confined to the wealthy or the idle. It seems to be a widespread social phenomenon. For instance, a correspondent in a small mining camp near the Mexican border writes that the Mexican laborers, who comprise six-sevenths of the population, are strictly amusement mad, spending their last pennies at the movies or the merry-go-round or for intoxicants.

It is possible that the same causes which are operating in this increased demand for relaxation are responsible to some extent for the increased demand for narcotics. Statistics of the last fifty years in nearly all civilized countries show a very remarkable per capita increase in the consumption of tobacco

* A more popular statement of the theory of play and sport offered in this paper appeared in the *Popular Science Monthly* June, 1914, under the title, The Psychology of Relaxation. One or two paragraphs from the former paper have been used in this.

and alcohol, the latter in countries where the rapid extension of " dry " territory would lead us to expect the opposite. The further rapid increase in the use of cocaine and other narcotic drugs, particularly in places where alcohol is not obtainable, strengthens the belief that there are conditions present in modern society which are intensifying the demand for some kind of release from some form of tension.

No doubt we have here material for a sociological study of great importance but it is the psychological aspect of the problem which I wish to discuss in this paper. Our psychology of play needs revision. The play of children must be more closely correlated with the play of adults and both must be studied in relation to the more general subject of recreation or relaxation. The three principal theories of play thus far proposed, the Schiller-Spencer theory, the Groos theory, and the recapitulation theory, are confessedly unsatisfactory and incomplete. They are all partial views, not necessarily inconsistent with one another, and they all fail to correlate children's play with adult sport or even neglect the latter entirely.

The Schiller-Spencer theory, that play is due to overflowing energy, is based upon the serious error, as I think Professor Dewey has suggested, of assuming that quiescence is the normal state of the child or man. It is as if one should say that under normal conditions the child or the man rests or works and that when energy accumulates or superabounds then he plays. Truer it would be to say that the child or man is a playing animal and that on those rare occasions when he has to, then he works.

According to the Groos theory of play the plays of animals and children are instincts, which have arisen through the action of natural selection because of their usefulness as a practice and preparation for life's later serious duties. Professor Groos has written two voluminous books on the play of animals and the play of man containing a wealth of material on these subjects but the reader cannot fail to be impressed by the lack of connection between the facts and the theory. The author seems, indeed, to have arrived at his theory of play through a purely deductive process. Since play is an instinct, and since, as we cannot admit the inheritance of acquired characters, every instinct has arisen in response to some definite practical need, and since it is evident that play has no immediate life-serving purpose, it must serve as a practice and preparation for life's serious pursuits. In this argument the premises may be sound but the conclusion

has no necessary connection with them. Plays, indeed, are instinctive, and no doubt all instinctive reactions have had at some time in our racial history some life-serving meaning. But the fact that natural selection has not yet eliminated the great multitude of old racial habits with which the nervous system of the young child teems does not prove that they have been retained because of their usefulness as a practice and preparation for future life. In any animal species such as man, that lives in a changing environment, and has a long period of youth followed by a period of great rational power of transformation, we may expect behavior to be largely determined by inherited habit. As Professor Thorndike says: "We fear, not the carriers of malaria and yellow fever, but thunder and the dark; we pity, not the gifted youth debarred from education, but the beggar's bloody sore; we are less excited by a great injustice than by a little blood." [1] We are no longer so impressed by the infallible powers of natural selection as when Professor Groos wrote. Man's original nature is not so perfect as we once thought. We are more impressed by its "archaic unreason."

And even in the case of instincts which are now useful, it does not follow that, if they appear before the time of their life-serving usefulness, they must serve as a practice and preparation for such later use. Nature is not so parsimonious and calculating as that would indicate. It is not necessary to explain the doll plays of little girls as a practice and preparation for their future maternal duties. They may be simply exhibitions of a maternal instinct which sometime in the life of the individual may be useful, as when a tree showers down ten thousand seeds, of which one only may germinate. So the fighting plays of boys may be simply old racial habits, the line of least resistance for boyish activities.

In one sense, to be sure, if one should wish to look at the matter teleologically, play, like food or sleep, or like growth itself, is a preparation for manhood. But it is better to regard the child as a playing animal, realizing in himself his own end. Play, like growth or life itself, belongs to the concept of childhood. Play is just the name we give to the child's activities. In the Groos theory, as in that of Spencer, there seems to lurk the belief that the child is naturally quiescent, and that if he plays, his play must look forward to that particular aspect of life which we call his serious or bread-winning activity.

When we consider what the plays of children actually are,

[1] Thorndike, Educational Psychology. The Original Nature of Man, p. 281.

we discover, except in a very limited number of imitative plays, but faint resemblance between them and the serious pursuits of adult man. They resemble rather the pursuits of primitive and prehistoric man, and many of them are like the sports of adults of the present day. The plays most dear to the hearts of boys are running, jumping, climbing, coasting, skating, wrestling, wading, swimming, boating, fishing, hunting, shooting with darts, spears, arrows, or guns, building bonfires, robbing birds' nests, gathering nuts, collecting stamps, eggs, beetles or other things, flying kites, digging caves, making tree houses, spinning tops, playing horse, playing marbles, jackstones, mumblepeg, hide-and-seek, tag, blackman, prisoner's base, leap-frog, base-ball, foot-ball, tennis, cricket, golf, etc. Children of all ages have the greatest interest in pet animals, dogs, cats, rabbits, birds, horses, etc. No small part of the child's life is occupied with playing with these pets and in earlier years with toy animals of all kinds. To these plays should be added, of course, the countless indoor games, such as checkers, chess, cards, dominoes, etc.

These children's plays have so little in common with the later pursuits of adult life that it is evident that some quite other theory is needed to explain them than the practice and preparation theory. When the boy is grown to manhood he will not be found doing these things, except in his hours of relaxation. His serious pursuits will take other forms. He will be found cultivating the soil, harvesting his crops, shoveling dirt, sand, or coal, blasting rocks from quarries and minerals from mines, building houses, buying, selling, manufacturing or transporting goods, teaching school, healing diseases, preaching sermons, practicing law, engaging in politics or commercial transactions, giving lectures or conducting scientific research. This is the " serious " life of to-day and the life of the ancient Romans, Greeks, Egyptians and Assyrians was much the same, and it is all far removed from the play life of the child, which likewise is much the same in all ages and involves altogether simpler forms of response. If the serious life of to-day consisted in escaping from enemies by foot, horse or paddle, in living in close proximity to domestic animals, in pursuit of game with bow or gun, in subsisting on fish caught singly by hand, in personal combat with fist or sword, in throwing missiles, striking with a club or pursuing an enemy, in seeking safety in trees or caves, in living in tents or tree houses, and in sleeping and cooking by a camp fire, then we might venture to explain the play life of the child as " an instinctive activity existing for purposes

of practice or exercise and without serious intent." But these are not the pursuits of adult men, *except in their hours of sport.* The great body of children's plays find their significance not in their likeness but in their unlikeness to their future laborious duties. In fact the plays of children bear a striking resemblance to the sports of men, and the latter would not be sports if they did not stand in direct contrast to work.

As regards the imitative plays of children, which indeed form but a small proportion of all their plays, the resemblance to the serious activities of adult life are, of course, closer, and to them the Groos theory of play would seem to be less strained in its application. But the imitative plays themselves are not instinctive for the reason that they are imitative. If it is meant merely that imitation itself is an impulse which has been perpetuated by natural selection owing to its usefulness in preparing children for mature life, this view might, indeed, be maintained if one still wished to put so much emphasis upon natural selection.

Other objections to the Groos theory may be passed with a mere reference. Perhaps the most serious of them is the failure of this theory to explain adult sports and to correlate them with the plays of children. Again, one is troubled by the frequent use of the word "serious" as applied to the activities of the adult, while the plays of children are spoken of as "sham," "make-believe," or "self-illusory." I do not believe that this distinction can any longer be held. Child life and its plays are quite as serious and quite as real as the life of the man. If we are to speak of "ends," it would be difficult indeed to show that the life of the grown-up is any more final or purposeful than the life of the child. Would it not be just as appropriate to say that the man's toil and sweat are a preparation for the radiant childhood of the son and daughter whom he may beget, as that the plays of childhood are a preparation for the prosaic work-life of the father? And as for seriousness, to the boy hastily swallowing his dinner or rushing through some uninteresting task to join his fellows in a game of ball or a trip to the river, it is the latter and not the former that are serious and real. It is a notable fact that most children take but a passing or trifling interest in what they eat and scarcely remember their food of yesterday. It is a peculiarity of the adult masculine mind to be very intent on the bread-winning aspect of life and on the preservation of the species. Perhaps nature exploits man for these particular aspects of life, which in them-

selves are but partial views. They might even be looked upon as necessary evils, subordinate in "purpose" to childhood, play, sport, art and sympathy, which are more real and final.

In reference to the Groos theory of play, some critics have been misled by the fact that certain games, like base-ball, seem to provide valuable training in such qualities as obedience, co-operation, quickness of decision, fortitude in defeat and endurance. That the game cultivates these virtues to some extent is doubtless true. One can hardly suppose, however, that natural selection has operated to form an instinct for base-ball because of its especial usefulness in providing such training. Other explanations for the fascination of this game are much simpler, as we shall see. Women, also, have need of these virtues but they do not care to play base-ball.

Professor Groos has more recently supplemented his work by a *katharsis* theory of play,[2] already anticipated by American writers. According to this particular form of the *katharsis* theory, play is a kind of safety valve for the expression of pent-up emotion, as for instance in the fighting plays of children, where the pent-up emotion is anger. According to this view, one would understand the emotions to be some kind of internal forces which would do damage if they could find no escape. It is not, however, probable that Professor Groos or anyone holds this naïve view of the emotions, and the whole relation may be more simply expressed if we suppose that the fighting plays are among the natural or spontaneous activities of children and as long as they are freely indulged in, the child is free from hurtful emotions. If these activities are repressed then no doubt would occur certain internal disturbances of a less healthful character. Where spontaneous responses are inhibited, readjustments are necessary and emotions are present. When the spontaneous response is resumed, the emotion subsides. In this way children's plays might seem to have a *katharsis* effect. In spontaneous unrestricted play, however, there would seem to be no such element present or necessary. In the sports of men indeed, an effect of this kind, as we shall see below, sometimes appears, but it is really due to the restoring of disturbed balance and the *katharsis* figure is less applicable. It is a kind of rest rather than a kind of purification. The drama, for instance, like other forms of rest and relaxation and like all play and sport, has a distinctly harmonizing effect, but when the psychological

[2] Das Spiel als Katharsis. Zeitschrift für Päd. Psych. u. Ex. Päd. December 7, 1908.

situation is carefully examined, Aristotle's medical simile is found to be not altogether appropriate.

The third theory of play has been called the recapitulation theory. This takes full cognizance of the anthropological significance of play, and indeed is based upon it. As regards the latter, all future theories of play must take carefully into account the numerous and striking similarities between the plays of children and the pursuits and customs of primitive and prehistoric man as they have been fully pointed out by President G. Stanley Hall and his associates.[3]

But the question arises as to the reason for this resemblance and if the correct reason is not found, the whole significance of play may be lost. The theory in question does not explain this resemblance except by referring it to a so-called law, the law of recapitulation, according to which each individual passes through a series of stages in his development corresponding to the stages of racial development. Even in the sphere of embryology the validity of this law has been much questioned and it is looked upon with increasing distrust when applied to the period of post-natal or psychological development. It should be said, however, that this theory of play is the only one that has attacked the specific problem of accounting for the form taken by children's play and in this attempt its success has been marked. Perhaps the most serious difficulty with this theory is its failure to explain the plays of adults and to correlate them properly with those of children.

The main purpose of the present paper is to examine more carefully the grounds of the resemblance between children's plays and the pursuits of primitive man and more particularly to determine if possible the similarity which exists between both of these and the sports of the mature man of the present time. Tentatively I will put forward three propositions, which if true would greatly simplify the psychology of play.

I. The term 'play' may be applied to all those human activities which are free and spontaneous and which are pursued for their own sake alone. The interest in them is self-developing and they are not continued under any internal or external compulsion. Play will thus include practically all the activities of children and the larger share of those of adults, such, for instance, as base-ball, foot-ball, tennis, golf, polo, billiards and countless other games and sports; diversions

[3] G. S. Hall, Adolescence, Vol. I, p. 202, *et seq.* L. M. Gulick, Interest in Rel. to Mus. Ex. Amer. Phys. Ed. Rev. VII, 2. Guillet, Recapitulation and Education. Ped. Sem., VII, 397. Robinson, The Primitive Child. N. A. R., CLIX, 467. Patrick, The Psychology of Football, A. J. P., Vol. XIV, pp. 104-117.

such as traveling, hunting, fishing, yachting, motoring, flying, dancing; vacation outings, games, races, spectacles, fairs, tournaments and expositions; the theatre, opera, moving pictures, lectures and entertainments; the enjoyment of music, painting, poetry and other arts; the daily paper, the magazine, the short story and the novel.

The term 'work,' on the other hand, will include all those activities in which by means of sustained voluntary attention one holds oneself down to a given task for the sake of some end to be attained other than the activity itself. Such activities involve mental stress, strain, effort, tension, concentration and inhibition.

II. The plays of children and the sports of adults are to be closely co-ordinated and explained by reference to the same general principles.

III. There is a striking similarity between the plays of children and the sports of men on the one hand and the pursuits of primitive man on the other. This similarity is due to the fact that those mental powers upon which advancing civilization depends, especially voluntary and sustained attention, concentration, analysis and abstraction, are undeveloped in the child and subject to rapid fatigue in the adult. Hence the child's activities and the play activities of the adult tend always to take the form of old racial pursuits.

If we look at the matter physiologically, it is very evident, in the case of the adult man, that there are some brain centers, or some form of cerebral functioning, that are put under severe strain in our modern strenuous life and that there must be some kind of activity which will relieve these centers during a considerable portion of each waking day and involve other centers not so subject to exhaustion. Such activity we call play or sport. Perhaps the word relaxation would be a more exact description of it. For our present purpose it does not matter in the least what these centers are or what manner of cerebral functioning this is. It is only necessary to note the evident fact that there is some form of cerebral activity associated with those peculiar mental powers the development of which has made possible human progress.

Nor again is it necessary for our present purpose to make any exact enumeration of these so-called higher mental processes which distinguish the modern civilized man. Generally speaking, however, they probably include a constantly increasing power of sustained attention of the voluntary kind, controlled association, concentration and analysis, together with a constantly increasing power of inhibition. The indi-

vidual becomes increasingly able to hold steadily in view the image of a desired end, to inhibit the old and habitual responses which are no longer appropriate to that end, to analyze a given situation in thought, so that the response may be to certain elements in the situation rather than to the situation as a whole, and thus to meet a given situation with a new response. Only the fully developed adult mind is capable of much thinking of this kind, and at best it is highly fatiguing and cannot be continued through many hours of the waking day, so that all, or almost all, the hours of the child's day and the larger number of hours of the adult's day must be filled with responses of the simpler, more elemental and racially older kind. Consequently children's play and adult sport tend to take the forms of old racial activities, involving brain tracts that are old, well-worn and pervious.

It is well known that the present tendency in both historical and anthropological study is to place less emphasis on the differences in the mental constitution of different races of men.[4] All existing races and all historical ones, so far as we can see, are much alike in their mental powers. But from our present point of view these races are all modern. It is clearly evident that in comparing modern civilized man with the highest of the lower animals or with his prehistoric, if not even with his primitive, ancestors, there has been an unmeasured advance in the powers above mentioned. Even this assumption, however, is not necessary so far as our present theory is concerned. It is merely necessary to notice that in seeking relief from the fatigue involved in that sustained and voluntary attention, controlled association, analysis and abstraction which are essential to our or to any advancing civilization, we fall back upon a set of activities which no longer involve these processes, but which through ages of use have become familiar and easy.

Hence we understand why children's play and adult sport take the form of hunting, fishing, camping, outing, swimming, climbing, and so on through the long list. The more elemental these activities have been in the history of racial development, the greater release they afford when indulged in as relaxation from the tension of our modern life. This is well illustrated in the case of base-ball and foot-ball. Foot-ball reinstates very ancient and very elemental forms of response, such as the face to face opposition of two hostile forces, the rude physical shock of heavy opposing teams, the scrimmage-

[4] Comp. Boas, The Mind of Primitive Man. Thorndike, Ed. Psy., Vol. I, p. 240.

like character of the collisions, the tackling and dodging and the lively chases for goal as for cover.

Base-ball again is a game combining three of the most deep-seated instincts, the instinct to throw, to run and to strike. In the distant past of our race survival has come to him who could throw the straightest, run the swiftest, and strike the hardest. Throwing, batting, running are no longer of service in this age of mind, but they were once the condition of survival. To throw something at something is almost as natural for a boy as to breathe. Base-ball reinstates these ancient responses and its appeal is correspondingly great. "Base-ball," says Dr. Gulick, "is a complex of elements all of which date back certainly to our prehuman ancestors. The ability to throw a stone with accuracy and speed was at one time a basal factor in the struggle for survival. The early man who could seize the bough of a tree and strike with accuracy and great power was better fitted to survive in the brutal struggles of those early days than the man not so endowed. He could defend his family better, he was better fitted for killing game, he was better fitted for overcoming his enemies. The ability to run and dodge with speed and endurance was also a basal factor." [5]

The instinct to throw, as the same author shows, belongs to boys only, scarcely appearing in the case of girls. The awkward throw of girls, like the left arm throw of boys, is well known. The plays of girls reveal their own set of instincts recalling the habits of primitive woman. "We are the descendants of those men who could throw and those women who loved children."

The law that the more elemental the character of our responses the greater their value as relaxation and release from the tension of the strenuous life, is well illustrated in the sports of the ancient Romans. Their favorite sports took the form of spectacles exhibiting bloody contests of men and beasts. The appeal of these scenes was so powerful that no national calamity could quench the popular demand for them, a demand which could be met only by such stupendous structures as the Coliseum and the Circus maximus, the latter probably seating 300,000 spectators. But there is nothing that has been more elemental in the history of the human race than these contests. Man's racial history has been one long battle with the lower animals, defensive for life and safety, offensive for food and sustenance. So far as the work-a-day life of the

[5] "Interest in Relation to Muscular Exercise," by Luther Gulick, M. D. American Phys. Ed. Rev., Vol. VII, 2.

Romans is concerned, it was much the same as ours, taxing the same higher mental powers and demanding relaxation in the form of older and simpler pursuits. Even now, cock fights, bull fights, and prize fights have a powerful fascination for certain classes of people. As Dr. Gulick says, "The racially old is seized by the individual with ease and joy."

We are now able to understand why certain sports, such as golf, base-ball, foot-ball, the dance, the prize fight, and perhaps the fighting plays of children seem to have a kind of *katharsis* effect. They offer a release which is not found in such sports as bicycling, motoring, moving pictures, lectures, and entertainments. The latter, indeed, afford a certain rest and recreation, but being less ancient and elemental, the release they afford is not so great. In the game of golf the situations are all elemental,—the stick, the ball, the swinging stroke, the return to outdoor life, the tramping over hill and through ravine and the recreational value of this game is very great. In the case of base-ball, foot-ball, the circus and the spectacular games, the spectators rather than the participants are the ones who enjoy the greater relaxation. Indeed, for the latter it is, at any rate in the professional games, a form of work rather than of play, since it is engaged in for ulterior ends. For the spectators, however, these games afford an absolute rest, relieving the higher brain centers completely and allowing the individual to revel in old and latent racial memories. This complete abandonment to primitive instincts is clearly shown in the behavior of the spectators at a great foot-ball match, in their facial expression, their shouting, their gesticulation and their language. The dignified man of office, pulpit, laboratory or lecture room is scarcely recognizable.

Stage managers, story writers and moving picture shows seek always for a new thrill. It is sometimes thought that the new and unexpected is thrilling. The reverse is true. The thrilling is the old and elemental. When love and warfare fail, the story writer can always fall back on the horse race for thrills. The horse has little significance for the life of to-day and it is fast becoming less, but he has had an intimate relation with the life history of the race. It is difficult to read any well-told story of a horse race or chariot race or any account of human rescue by means of equine or canine intelligence without an emotional disturbance out of all proportion to the importance of the event. Likewise all new exhibitions of speed are thrilling. The supreme joy in speed, whether exhibited in running, skating, coasting, or riding with fast horses, cars, sailing vessels or air ships is explained when we recall the survival value of speed in human history. It

points back to ages of racial experience in pursuit of and escape from both man and beast.

From our point of view, therefore, the psychology of play is much simplified. So far as the plays of children are concerned, they play because they are children, which means that play is the name we give to their activities. If the child does anything, he must play, for the simple reason that those brain centers upon which work depends have not yet begun to function. The child's activity therefore, takes the form, or tends to take the form, of long established racial habits. In manhood the plays are much the same and the explanation is much the same. The grown man has mental powers which the child hardly yet possesses, but he cannot use these during all the waking hours of his day. When he uses them he is working; when not, he is playing; and the essential character of all his play is that it shall offer release from the strenuous life, whether the latter take the form of acute mental work or whether it take the form of sustained effort to keep at a given task after interest in it has ceased.

Our modern life, whether in the laboratory, the school room, the lawyer's or the merchant's office, or whether in the factory or the shop or on the farm, is a life of high tension. Release from it is essential and unless this release take healthful forms, as in play, sport, outdoor life, holidays, etc., it will take unhealthful forms, as in dancing crazes, war crazes and the like. A form of artificial and temporary release from the strenuous life is found in the use of narcotics of all kinds, such as tobacco, alcohol and other drugs, whose action is to paralyze slightly the higher brain centers and release the older and more primitive impulses. Their effect is similar therefore to that of play. Unfortunately no one yet knows just how much damage to the individual and to the race this constant doping of the brain may effect. The action of these drugs is not yet well understood. That of tea and coffee still less. But when we recall that the annual consumption of alcoholic drinks in the United States is more than two thousand million gallons, of tobacco about 440 million pounds, of coffee more than 858 million pounds and of tea about 94 million pounds, and that none of these things, so far as is known, add anything to the physical economy of the body, it is evident that we have here fruitful themes for further physiological and psychological studies.

In fact the world has lately been getting too severely serious and laborious. Too much hard thinking is demanded to keep up the modern pace. Whether in journalism, in literature, in scientific research, in mechanical invention, in social and edu-

cational reform, in labor movements, or in the feverish struggle for wealth, the higher brain centers are taxed to a degree incommensurate with the possibility of physiological adjustment. Our physical constitution cannot so quickly adapt itself to this sudden increased demand upon certain specific nervous functions comparatively new and unstable. Reactions of one kind or another are therefore inevitable. We are witnessing a marked increase in insanity and a new and startling demand for narcotic drugs. In America we have the amusement crazes, obsessions of dancing, motoring, base-ball, moving pictures, etc., together with a healthy revival of athletic sports, playground and recreation movements and interest in out-door life. In Europe, where the temper of the people lends itself less readily to these forms of release, we have witnessed the reaction in its most repulsive form, in a debauch of bloodshed, in a return to the most brutal and the most elemental of human reactions, that of war, which rests the higher brain centers completely. It is really a physiological situation that the peace societies have to contend with. Mankind cannot so easily escape from its long past.

In conclusion it should be said that it is doubtful whether the tendency shown in children's play and in adult sport to take the forms of old racial activities can be subsumed under such names as survival, reversion, or recapitulation. These biological terms are all too narrow and they carry a certain reproach which does not pertain to the play and sport activities. It is a wholly unwarranted assumption that those peculiar forms of psychosis which in a special manner characterize the adult masculine mind are of any higher order than those which are exhibited in play in the broader sense in which we have used the term. The latter represent more fundamental forms of human behavior and perhaps more valuable. Just at the present time evolution seems to be tending toward the development of those high-tension masculine traits by which man adapts himself to his environment and which produce something which we call progress or civilization, a civilization, however, in no way remarkable except in the way of its frenzied reactions. It is the age of work, the age of stress and effort and tension, the expansive, centrifugal age, the age of outer conquest but not of inner harmony. At such a time, comforts, luxuries, and inventions abound, side by side with profound misery. Is it not possible to think of a higher civilization than ours,—a civilization faintly realized by the ancient Greeks—where the play motive will be ascendant and where a greater degree of repose, of measure, and of harmony will be attained?

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A NOTE ON THE SINISTRALITY OF CHILDREN

Prompted by the work of P. B. Ballard[1] with left-handed children, the following observations were made on three naturally left-handed boys, eight years of age, who had been taught to write with the right hand.

Following Mr. Ballard's methods, six eye-tests and eight foot-tests were made, showing the boys to be left-eyed and left-footed respectively. No tendency to stammer was observed.

When not observed, these boys drew with the left hand, with better results than when using the right hand. When the objects to be drawn were not symmetrical, there was a reversal, that is, the left side of the object was drawn on the right side and the right side on the left. They also wrote spontaneously in the mirror, seemingly showing that the left hand had been trained at the same time as the right.

Again, using four tests with a class of fifty-eight boys, twelve proved to be right-footed, eighteen left-footed, the others using either foot indifferently. All proved to be right-eyed, except the three dextrosinistrals (left-handed persons taught to write with the right hand) and two other boys, one of whom wrote well with the left hand.

Full details of this work were published in the March number, 1913, of the *Bohemian Pedagogical Review* (*Pedagogické Rozhledy*).

EMANUEL LIPPERT.

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[1] Ballard, P. B. Sinistrality and Speech. *Jour. of Exper. Ped.*, vol. I, 1912, pp. 298–310.

BOOK NOTES

The Hygiene of the School Child. By Dr. Lewis M. Terman, Associate Professor of Education, Leland Stanford Jr. University. Houghton-Mifflin Co. $1.65.

This is a volume devoted to the conservation of the health of children of school age, and more especially to those who are in attendance at school. Probably the most important chapters bear the following headings: the physical basis of education, general laws of growth, factors influencing growth, physiological differences between children and adults, educational significance of physiological age, disorders of growth and hygiene of posture, malnutrition in school children, tuberculosis and the school, physiology of ventilation, teeth of school children, hygiene of vision, preventive mental hygiene, speech defects of school children, sleep of school children, and the final chapter, some evil effects of school life.

The author has, as the above headings indicate, devoted the main part of the book to a consideration of the problems of the health of children, and has not undertaken in any adequate manner to discuss the connection between the physical environment of school life and the health of school children. The volume contains much information gathered from the published results of scientific investigations made in all progressive countries. At times one feels that some of the information thus introduced has but little bearing on the question in hand, but in general the facts collected are well worth while, and will materially aid those who are in search of a broader point of view. This book may be heartily commended to all who are striving both to conserve and develop the physical and mental health of our children.

F. B. DRESSLAR.

Health Work in the Schools. By Dr. E. B. Hoag and Dr. Lewis M. Terman. Houghton-Mifflin Co., Boston. pp. xiv-321

This is a decidedly useful book for school health officers, superintendents, and teachers. It deals, as the title indicates, with the problems which always arise when school officers set to work in a careful way not only to guard the health of the school children, but also to see to it that they develop better health. The chapter headings are as follows: Social responsibility for the health of school children; The scope and administration of health supervision; Plans for organization for health work; The school nurse: including suggestions for health supervision by the 'nurse alone' plan; The health grading of school children by teachers; A demonstration clinic for instruction in the observation of defects; The school medical clinic; School dentistry; Transmissible diseases (three chapters); Open-air schools; School housekeeping; The teaching of hygiene: first six grades; The teaching of hygiene: seventh and eighth grades; The teaching of hygiene: education with reference to sex; The teacher's health; What the world is doing for the health of school children; Appendix, which includes a short statement of the organization and administration of health work in a few of the important cities of the country, a suggestion for a teachers library in school hygiene, and a glossary.

At the close of each chapter a selected list of references to the most important magazine articles and books bearing on the theme of the chapter, is given. The book is designed to help place the emphasis on health teaching and health development, instead of upon the usual incomplete 'medical inspection' method.

F. B. DRESSLAR.

Fourth International Congress on School Hygiene, Buffalo, New York, U. S. A., August 25-30, 1913. Transactions. 5 volumes. Buffalo, Thomas A. Storey, 1914.

Of these stately volumes, the first is almost entirely devoted to the organization and the transactions of the Congress and the names and addresses of those connected with it, together with the few papers on the program of the general meetings, viz., the address of the president, C. W. Eliot, that of Sir James Grant on school hygiene and child life, and that of G. Stanley Hall, the hygiene of appetite and that of eating. The second volume begins the section meetings by sessions, the first being the hygiene of buildings, grounds, material equipment and upkeep; the second, that of school administration, curriculum, etc. Volume three begins the instruction in hygiene, fatigue, nervousness, the mentally abnormal child, with special instruction in hygiene. The fourth volume, section three, is medical hygiene and sanitary supervision. Then follows school hygiene, relation to the home and the community. While the fifth volume begins with crippled children, the conservation of vision, mouth hygiene, etc., and passes on to tuberculosis, child labor, the abnormal child, the Binet-Simon school. Section five is of psycho-education clinics. This fourth Congress will rank high among the series so far held, but in the general sentiment of those present it will not be deemed quite equal to the European Congresses that have preceded it. The attendance of foreigners, particularly those of prominence, was relatively very small, although a few of the best men were on hand. The secretarial and organizing work was done with remarkable efficiency, and all in all this is by far the most important meeting ever held in this country on this new and vital subject. It is of great interest as revealing the state of progress and of general knowledge which has so far been attained in this country.

The Mental Health of the School Child. By J. E. WALLACE WALLIN, Ph.D. New Haven, Yale University Press, 1914. 449 p.

After many years of study and experience this author has at last gathered his conclusions into a very attractive and suggestive volume of nineteen chapters, covering such topics as medical and psychological inspection of school children, the new clinical psychology and psychologist, what the former is and is not, functions of the psychological clinic, its distinction from school hygiene, its human efficiency, research in a New Jersey state village for epileptics with results from the Binet-Simon tests, present status of these tests of intelligence, current misconceptions regarding them, re-averments respecting psychogenetical norms and schools of development, individual and group efficiency, euthenical and eugenical aspects of infant and child orthogenesis, the latter as applied to oral, dental and mental methods of measuring orthophrenics, of removing physical handicaps, mental and dental inspection in Cleveland public school, provision for the mentally unsound children, and a scheme for the clinical study of more unusual children. The book abounds in graphs, tables, is well

printed, and indicates and constitutes altogether the very best contribution to American studies in this field. The author gives us here a happy combination of large theoretical and detailed practical studies.

Pre-Meiji Education in Japan. A Study of Japanese Education previous to the Restoration of 1868. By FRANK ALANSON LOMBARD. Tokyo, Japan, Kyo Bun Kwan (Methodist Publishing House), 1913. 253 p.

This writer has spent many years in his present chair of education in Doshisha University, Japan, and has also spent some two years in residence at Clark University. The world has come to look with great interest on the marvelous system of philosophy, ethics, and educational ideals in ancient Japan, before the new regime that began in 1868. The government some years ago had gathered up the very comprehensive literature concerning this ancient Bushedo, or chivalric period, and this has made it accessible. We rather infer, although we cannot distinctly tell, that this is the first English author to use this material. The chapters are, the first intellectual awakening, the government system of education from 1602 to 1868, individual efforts, literary culture and education of women, social education, physical training, foregleams of the second great awakening, and finally educational problems. The book will constitute interesting reading for all concerned with education.

Eugenics: Twelve University Lectures. New York, Dodd, Mead & Co., 1914. By different men. 342 p.

The topics of this very interesting and valuable book are: The Eugenics Program and Progress in Its Achievements, by C. B. Davenport; Eugenics as Viewed by the Zoologist, by R. H. Wolcott; Eugenics from the Point of View of the Physician, by B. C. Vaughn; Eugenics as Viewed by the Physiologist, by W. H. Howell; Eugenics, Its Data, Scope, and Promise as Seen by the Anatomist, by H. E. Jordan; The View of the Geneticist, by J. Webber; The First Law of Character-making, by A. Holmes; Eugenics from the Standpoint of the Sociologist, by C. A. Elwood; Its Social Limitations, by G. Keller; Selections from an Address by W. H. Carruth; Eugenics and Economics, by M. A. Aldrich; Eugenics with Special Reference to Intellect and Character, by E. L. Thorndike.

Principles of Eugenics. By BLANCHE EAMES. New York, Moffat, Yard & Co., 1914. 90 p.

This little primer touches on heredity, instruction in sex truths, tobacco and drugs, parental instruction and environment, and finally continence. Each chapter has a few references which shows that the author has read wisely and well, and the book unquestionably has a place of its own due to its completeness and simplicity.

The Thinking Hand or Practical Education in the Elementary School. By J. G. LEGGE. London, Macmillan & Co., 1914. 217 p.

This book is the result of long and observant practical work. It treats of the growth of the idea, the application of the principle, work and play, a dream, plain facts, with five schemes mainly for girls, and four mainly for boys and has a score and a half of illustrations. The purpose of the book is to give some idea of one of

the most effective of the present day movements, viz., the development of the manual side of the curriculum, not in opposition to the intellectual, but in association with it. The book is written in plain English, not "pädagogische," and is in a spirit of protest against the mystogogic and its pretentious, portentous solemnity, which seems to the author a menace. He well defends himself against the old ideas of general as against special education, and then against the charge of trenching on the technical field. We hear too much of the captains of industry and neglect the rank and file. Industry is always for the sake of the product, and it is wrong to focus on the process only. Kerschensteiner has understood this idea. The author's title is the happiest and most apposite we can think of in all the wide literature of this field. More than a third of the book is devoted to illustrations and another third to details, schemes, and explanations. On the whole it is a most helpful addition to our knowledge on this subject.

The Modern High School: Its Administration and Extension. Edited by CHARLES HUGHES JOHNSTON, Ph. D. New York, Charles Scribners Sons, 1914. 759 p.

This work treats of the social administration of the high school, its institutional relations, legal status as a business enterprise, relations to the elementary and to higher and industrial education. Part two deals with the more intimate and specialized relationships of high school work, such as its curriculum, details of class management, direction of study as the chief aim, social value of school versus home study, form and school association, the conservative agencies. Part three deals with definite internal expressions of the social nature and function of the high school, its internal government, improvement of teachers, social activities of students, athletics, debates, journalism, fraternities. While part four deals with the high school as a social centre, continuation work, high school library, vocational and avocational guidance, cooperation in teaching, English, hygienic considerations, the high school as an art centre, its moral and religious agencies. The thirty chapters that constitute this book are mainly written by different authors and present very interesting and vital aspects of the great problem of the high school.

High School Course of Study. A constructive study applied to New York City. By CALVIN O. DAVIS. Yonkers-on-Hudson, New York, World Book Co., 1914. 166 p. (School Efficiency Series. Edited by Paul H. Hanus.)

The high school is happily now at last in the centre of discussion and it is earnestly to be hoped that present interest will not flag until reconstructions have been radical. This study, confined to New York City, is still further limited by its subject. The writer discusses the newer aims and conceptions, general and special aspects of the program, high school systems in ten cities, a general course in New York City compared with others of the ten, actual administration, special courses in New York City, criticisms and recommendations, summary. In our opinion, an author who confines his view essentially to New York City, or even to ten representative American cities, cannot be expected to reach the root of the difficulty with the high school. Most of his recommendations, however, are wholesome. They are that the high school shall be available to all young people, with additional schools of different types, pay

for transportation, more manual, domestic, commercial, statistical, scientific and other courses, more intensiveness and continuity to English, plane geometry, science, music, art, oral expression, and more flexible administration with less rigid specialized requirements for examination. Fifteen periods of English, four of history, four in science, four in social sciences, five in United States history, etc., totaling forty-eight periods. There should be more specific subjects for each year, a list of which is here given. Foreign languages should alternate with mathematics, principals should cooperate with their teachers, there should be suggested parallel curricula.

State and County Educational Reorganization. By ELLWOOD P. CUBBERLEY. New York, Macmillan Company, 1914. 214 p.

The author first gives the revised constitution of Oseola in 1913. Then follows revised school code with its administrative and educational organization, defining functions of the state, the board, the educational department. Then the county and district are discussed. The second title is the system of public instruction, elementary and secondary. Then comes vocational and supplemental, and higher and professional education, the support of the system, funds, the environment and equipment including buildings, health, sanitation, teaching force, their training, qualification, form of certificate, appointment, tenure, pay, pensions, reading circles, institutions, the state and the child.

Childhood and Youth Series. Indianapolis, The Bobbs-Merrill Co., 1914.

Learning and Doing. By EDGAR JAMES SWIFT. 226 p.

The Child and his Spelling. By W. A. COOK and M. V. O'SHEA. 254 p.

The High School Age. By IRVING KING. 225 p.

Natural Education. By WINIFRED SACKVILLE STONER. 272 p.

The Bobbs-Merrill Company here undertakes to present a culture series of works on childhood and youth by eminent experts, and these four volumes constitute the first installment of a more comprehensive scheme. Professor Swift's book is constructive and appreciative, and shows that he keenly appreciates the difficulties of both parent and teacher. The style is simple, direct, lively, and untechnical, and the author's end is largely practical. The chapters are as follows: the revolt from monotony; efficient teaching; gaining results; progress in learning; economy in learning; habit in learning and achievement; new demands on the school. The book has a very convenient index and a page or two of references of the literature bearing upon each chapter. It is admirably designed to meet the end which the series and which this special volume proposes, and was written by an expert who has unusual command of his subject.

The book by Professors Cook and O'Shea is a careful study of the rules for spelling, sources and causes of errors, the life history of certain spelling, columnar versus contextual spelling, methods of presentation, spelling efficiency, composition, some special factors in spelling. These chapters deal with learning to spell, while part second treats of spelling vocabulary under the captions of peculiar views of spelling, needs determining the written vocabulary of typical Americans, sources and character of data, certain lists derived from correspondence, spelling texts and needs, with an appendix of words used spontaneously by pupils. There is also a good reference list

for further reading. This is a more technical study, the first part dealing with themes of special interest to teachers, and the second with those that should appeal alike to teachers and parents. It is the first adequate and comprehensive attempt in English to sum up the many careful studies that have been made upon this subject from the time when Rice's now famous study began.

Adolescence has in the last decade become celebrated in literature. Nevertheless, we know very little about it, especially in the case of girls. Chapters in Professor King's book are: waste in the high school; physical changes of high school years; physical development and school of efficiency; a concrete case of the latter; mental changes in the teens; broadening vision; the birth of a new self; characteristic phases and dangers of the new self; high school period in retrospect; economic relations and social interests of the high school pupils; their study, habits, and amusements; the relation of sex in the high school to the entering age; and the adaptation of the high school to the needs of its pupils. This volume seems to the writer of this review the most inadequate of the series so far. The beginning of the high school age by no means corresponds with adolescence, and save a single reference, or perhaps two, there is no allusion to Dr. Hall's work, a comprehensive treatise which the author seems to have studiously ignored.

The topics treated in Miss Stoner's book are: notable examples of the early direction of tendencies by parents; earliest development; learning to talk; learning through nature's nurse, play; music and spelling; learning about nature; learning through stories, games and rhymes; learning foreign languages; explanations in the realm of mathematics, educational amusements; cultivation of the imagination; punishment by natural consequences; health first of all; parental influence and environment. The appendix contains a list of "magazines for children, mothers, and teachers, books which have helped Winfred, educational books that have helped me."

Literature for Children. By ORTON LOWE. New York, Macmillan Company, 1914. 237 p.

This is a book about books. There are first selections for memorizing for each school year from the first to the eighth. The next part treats the sources of standard prose for children. The peruser of this book will first of all try to ascertain on what principle the books and selections are made, and as far as he can gather, the author here has done nothing more than follow his own practically uncontrolled ideals as to what is best for children, and hence we have simply another of the innumerable rather *a priori* ideas of what is best, ideas on which no two people at present agree.

Your Child To-day and To-morrow. By SIDONIE MATZNER GRUENBERG. Philadelphia and London, J. B. Lippincott Co., 1914.

This books deals with some problems for parents concerning punishment, lies, fear and imagination, obedience, ideals and ambitions, work and play, social activities, adolescence, and heredity. The work is dedicated to the author's mother and children. As a member of a child study group she has found a vast body of material which she here seeks to make of practical use to the bringing up of children. Considerable attention is given to the instinct to create, climb, habit, play, romping, the danger that we shall forget how to play with children, and the advantages of country life.

Physical Growth and School Progress. A Study in Experimental Education. By Bird Thomas Baldwin. U. S. Bureau of Education, Bulletin, 1914, No. 10. Washington, Government Printing Office, 1914. 212 p.

The author bravely reviews, though briefly, the whole history of the subject and finally conveniently summarizes for us his own conclusions, correlated with those of literature. We have only space for a very few of his general conclusions, viz., first born children exceed those later born in height, and shorter continue to grow longer than tall children; growth in height is rhythmic; dull children are shorter than precocious children; country boys are taller than city boys; lungs share to a marked degree the augmented development of adolescence; the law of mean precocity is related to mean physical development, and average precocity to average physical development.

The Chalif Text Book of Dancing. By Louis H. Chalif. New York, Published by the author, 7 West 42nd Street, N. Y., 1914. 171 p.

The author of this work is past master in his art, combining in a very unusual degree theory and practice. In Europe he was a ballet master, and it is understood that he resigned this position and spent years in traveling to study the folkdances of various nations. He came to this country almost unknown and came near being exploited at first, but is at length making good and there is a large and increasing group of people who will welcome this modest handbook which makes no pretense and utterly eschews theory, but preserves the best portions of the Russian theory and practice of dancing.

Among English Hedgerows. By Clifton Johnson. Chautauqua Press, 1914. Chautauqua Home Reading Series. 347 p.

This book deals with the rural village, an evening with the nightingale, country work and workers, a springtime walk, home of the pilgrims, home of King Arthur, Stone-Henge, etc., and is illustrated by several score of pictures. The book has a brief commendatory introduction by Hamilton W. Mabie.

Through England with Tennyson. By Oliver Huckel. Chautauqua Press, 1914. 243 p. Chautauqua Home Reading Series.

This work treats of Lincoln and Lincolnshire, the fens, Somersby, the poet's birthplace, Louth and the old grammar school, Cambridge and college days, Tennyson's London, wedding-day, Hallam, Hawarden, Farringford and the Surrey Hills, Tintagel and King Arthur, Amesbury Abbey and Queen Guinevere, Camelot, etc., and has about two score illustrations.

Democratic England. By Percy Alden. Chautauqua Press, 1914. 263 p. Chautauqua Home Reading Series.

This volume is a series of articles written for the Chautauqua Magazine and brought up to date with one new chapter on state insurance. The chief items are: child and the state; sweating; the problems of old age, of housing the debtor, of municipal ownership, the labor movement, the municipality, land and the landless.

The Question of Alcohol. By EDWARD H. WILLIAMS, M. D. New York, The Goodhue Company, 1914. 121 p.

This work contains chapters on the drug habit menace, temperance instruction in public schools and its results, liquor legislation and insanity, the liquor question in medicine, what shall we do about it.

Primary Handiwork. By ELLA VICTORIA DOBBS. New York, Macmillan Co., 1914. 121 p.

The author follows the rubrics paper-cutting and poster-making, booklets, criticism and standards of workmanship, the house problem, the village street, sand-tables and what to do with them, animals and toys, holidays, general suggestions and summary. Some of the sixty odd cuts are ingenious, interesting and new.

The Beginner's Garden Book. A Textbook for the upper Grammar Grades. By ALLEN FRENCH. New York, Macmillan Co., 1914. 393 p.

This work is divided into autumn and winter work and the sections treat gardening under glass and the real garden. It is an interesting book combined with 211 illustrations and shows to good effect what has been done and can be done in the grammar grades.

Art in Education and Life. By HENRY DAVIES, Ph. D. Columbus, Ohio., R. G. Adams & Co., 1914. 322 p.

Professor G. T. Laird in his introduction well pleads for a larger place for aesthetic culture in our system of education, and the author after defining the problem discusses the nature and conditions of taste, the aesthetic resources of the schools, methods of developing taste, the educational value of the drama, democracy and art, and the warrant for reform. A rather meagre English bibliography is given at the end.

Souvenirs d'Education Familiale. Edited by J. RENAULT. Paris, P. Lethielleux, 1914. 200 p.

This is an interesting book giving some little sketch by each of the more prominent workers in this field in France, the pictures of whom are reproduced.

Undersökningar över Intelligensmätningarnas Teori och Praxis. Av G. A. JAEDERHOLM. 2 Vol. Stockholm, Alb. Bonniers Boktryckeri, 1914. 386 and 268 p.

At the Back of the North Wind. Simplified by ELIZABETH LEWIS. Philadelphia and London, J. B. Lippincott Co., 1914. (George Macdonald Stories for Little Folks.) 126 p.

The New York Times Index. A Master-Key to all Newspapers. Vol. II, No. 1, January-February-March, 1914. New York, New York Times Co., 1914. 489 p.

L'Année Pédagogique. Publiée par L. CELLÉRIER ET L. DUGAS. Paris, Librairie Félix Alcan, 1914. Troisième Année, 1913.

The Tangible Rewards of Teaching: a detailed statement of salaries paid to the several classes of teachers and school officers. Compiled by JAMES C. BOYKIN and ROBERTA KING. U. S. Bureau of Education, Washington, Government Printing Office, 1914. 461 p.

Primary Book. By FLORIAN CAJORI. New York, Macmillan Co., 1914. 285 p.

Handbook of Practice for Teachers. By CHARLES A. MCMURRY. New York, Macmillan Co., 1914. 141 p.